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Butte Shafts
Reclamation
Project, phase VI

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BUTTE SHAFTS RECLAMATION PROJECT
PHASE VI

DSL-AMRB-90-007

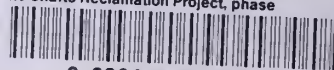
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FINAL REPORT

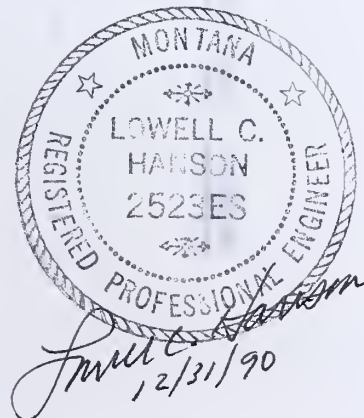
BUTTE SHAFTS RECLAMATION PROJECT PHASE VI :

DSL-AMRB-90-007

BUTTE-WALKERVILLE
SILVER-BOW COUNTY, MT
T3N, R7W, SEC 7 AND 18
AND
T3N, R8W, SEC 1,12,13,14,15,23,24

DECEMBER, 1990

PREPARED BY:
L.C. HANSON COMPANY
CONSULTING ENGINEERS & SURVEYORS
2969 AIRPORT ROAD
HELENA, MT



L. C. Hanson
Company
Butte Shafts
Reclamation
Project, phase VI

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1. INTRODUCTION

1.1 Site Description

The BUTTE PHASE VI project was comprised of hardrock shaft closures and maintenance of previously reclaimed hardrock sites. The shafts were primarily vertical shafts within the urban area of Butte and Walkerville. Typical shaft conditions included deteriorated shaft bulkheads, subsided areas within previously backfilled shafts, unsafe structures over shaft openings, and poorly backfilled shafts due to premature dredging of material during previous backfill attempts. Maintenance work included the repair and installation of erosion control structures, noxious weed spraying, and grouting of lifting rings on existing concrete caps to prevent corrosion of steel rings.

1.2 Map Showing Mine Location (see following page)

1.3 Project Objectives

The PHASE VI project is within the Department's overall program to address known hazards to public health, safety, and general welfare associated with inactive hardrock mines in the Butte-Walkerville urban area. The objectives of the work were: capping or backfilling vertical shafts, grouting lifting ring pockets, spraying for noxious weeds on previously reclaimed sites, repairing curbs and riprap channels, and revegetating disturbed areas. Throughout the course of the work, temporary shaft bulkheads and fencing were utilized to prevent accidental or deliberate entry of persons into the hazardous mine openings.

2. RESPONSIBLE PARTIES

2.1 Contractor

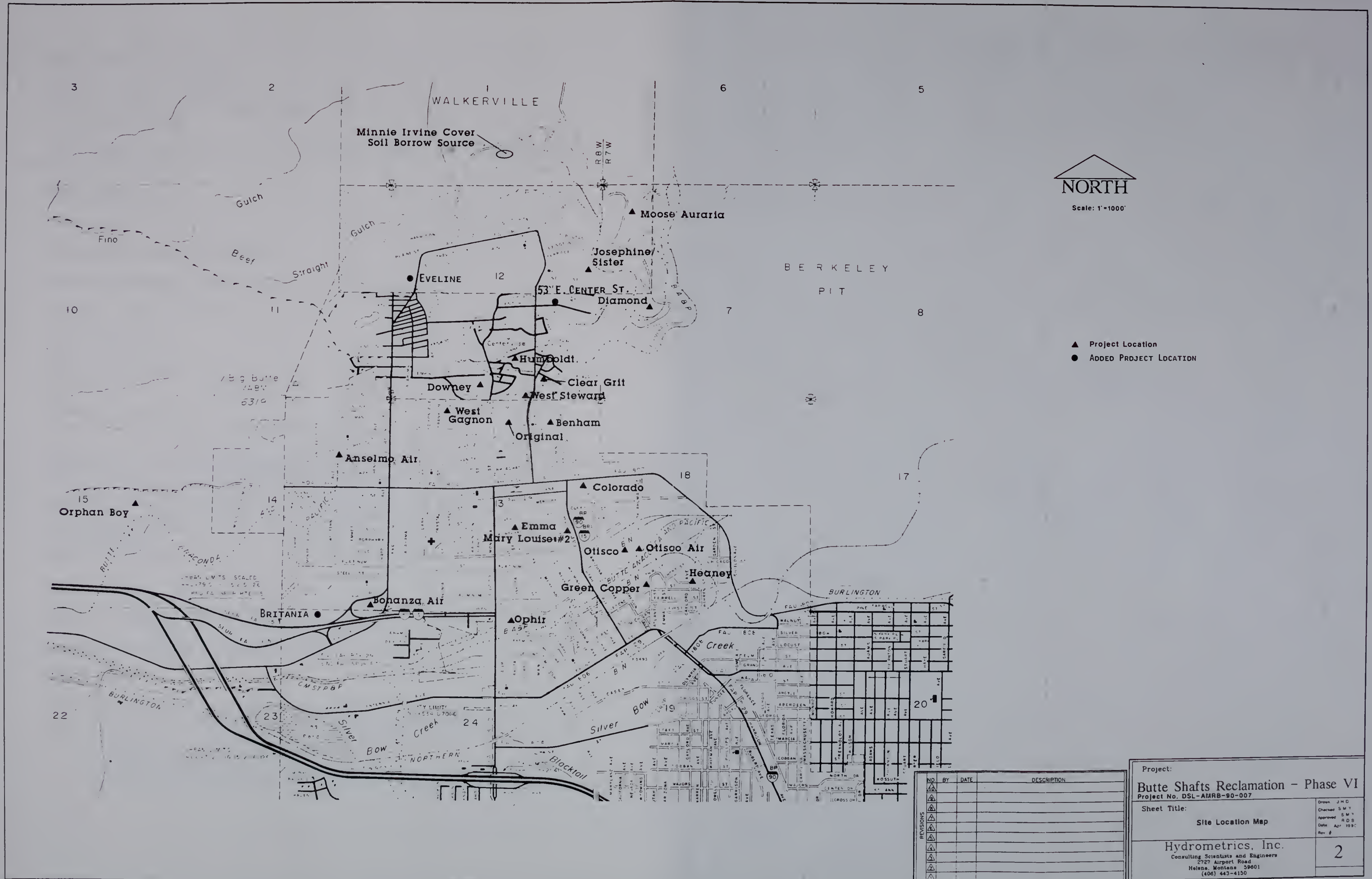
Skinner Enterprises
P.O. Box 5447
Helena, MT 59604

2.2 Reclamation Plan

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601

2.3 Engineering Plan

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601



2.4 Quality Control Inspection

Al Nye - Project Engineer
Kevin M. Redmond - Construction Inspector
L.C. Hanson Company

This project was assigned to L.C. Hanson Company just prior to the Preconstruction Meeting.

2.5 AMRB Coordination

John Koerth

3. CHRONOLOGICAL LISTING OF EVENTS

3.1 Pre-Bid Conference - June 7, 1990

3.2 Bid Date - June 14, 1990

3.3 Three Lowest Bids

Skinner Enterprises Helena, MT	\$163,107.00
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Gilman Excavating Butte, MT	\$170,915.35
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Bozeman Sand and Gravel Bozeman, MT	\$219,969.67
--	--------------

3.4 Contract Award

Skinner Enterprises
P.O. Box 5447
Helena, MT 59604

3.5 Notice of Award - June 23, 1990.

3.6 Notice to Proceed - July 23, 1990.

3.7 Construction Start-Up - August 15, 1990.

3.8 Change Orders -

3.8.1 Change Order No. 1 - December 5, 1990

- W.D.C. #1 - Backfill and fencing at Britania Shaft.
- W.D.C. #2 - Backfill yard opening at 53 E. Center Street.
- Supplemental work - Various sites.
- Placing concrete cap at Eveline Shaft.
- Reconciliation of Final Quantities.

3.9 Work Stoppages - NONE.

3.10 Requests for Payment (Skinner Enterprises)

Request No. 1 (FINAL) - \$154,418.59 Granted - December 5, 1990

3.11 Substantial Completion - October 30, 1990

3.12 Final Completion and Approval - October 31, 1990

Final inspection performed with John Koerth and Kevin Redmond. Visually inspected all sites including noxious weed spray areas, grouting work, and the additional sites, i.e., Britania, Center Street, and Eveline.

3.13 Final Payment

Final Payment - \$154,418.58 Date: December 5, 1990

4. CONSTRUCTION

4.1 Description of Project Plan

A. Otisco Shaft

The reclamation plan at this site consisted of salvaging and replacing cover soil, excavating waste rock to enable shaft capping at the existing collar level (~ 16' below surface) and to provide positive drainage in a southerly direction, and reclaiming disturbed surfaces. In order to accomplish this work, it would be necessary to dispose of an estimated 2300 C.Y. of waste rock, construct gravel support pads, place limestone veneer over remaining exposed waste rock, and place a minimum of 18" of suitable cover soil over the limestone veneer. Excavated waste rock would be used for backfill material at the Otisco Air Shaft located nearby. Final work included mulching, fertilizing, and seeding of the prepared cover soil.

B. Otisco Air Shaft

The plan called for removal of a wooden surface structure and shaft collar, backfilling of the open shaft with waste rock from the Otisco Shaft, site grading and cleanup, revegetation of all disturbed areas, and installation of a temporary bulkhead if the work could not be completed in one day to avoid an unattended open shaft.

C. Benham Mine Site

Work at this site, under this contract, called for excavation and removal of pavement to expose the shaft and installation of precast concrete channel sections over the shaft. In order to accomplish these objectives, it would be necessary to construct gravel support pads on which to install the concrete channel sections and to install a temporary surface bulkhead over the shaft. Additional and incidental work consisted of removal of the shaft collar and shaft

timbers, as necessary. Other work consisted of removal and replacement of pavement and a basketball backstop, and general site cleanup. Excavated waste rock would be stockpiled at the toe of the waste rock dump as shown on the Plans for removal under a separate EPA contract. Removed pavement was to be disposed of off-site.

D. Anselmo Air Shaft

Proposed work at this site consisted of installation of precast concrete channel sections over the shaft, reclaiming areas disturbed by the construction, and welding shut the steel door on the concrete tower northeast of the shaft. In order to accomplish these objectives, it would be necessary to construct gravel support pads on which to install the concrete channel sections and to install a temporary surface bulkhead over the shaft. Additional and incidental work consisted of removal of the concrete shaft collar and shaft timbers, as necessary, to complete the work. Other work consisted of general site cleanup including minor finish grading after the concrete cover was installed, and liming, mulching, fertilizing, and seeding of the area disturbed by the construction. The existing chainlink fence was to remain in place.

E. West Steward Site

The plans at this site consisted of pavement removal, excavating the top 25 feet of the shaft, adding water to promote consolidation of existing fill, refilling the top 25 feet of the shaft, and general site cleanup. A temporary surface bulkhead was required if the work could not be completed in one day.

F. Green Copper Mine Site

The plan at this site consisted of excavating the top 25 feet of the shaft, adding water to promote consolidation of existing fill, refilling the top 25 feet of the shaft, general site cleanup including finish grading and site reclamation. A temporary surface bulkhead was required if the work could not be completed in one day.

G. Heany Mine Site

Proposed work at this site consisted of backfilling two shafts and one raise on the site by removal and stockpiling existing waste dump as needed to access shafts, excavating the top 25 feet of each shaft, adding water to promote consolidation of existing fill, refilling the top 25 feet of the shafts, and general site cleanup. A temporary surface bulkhead was required if the work at the shaft could not be completed in one day.

H. Humboldt Shaft

The plan at this site consisted of installing precast concrete channel sections over the shaft and reclaiming surfaces disturbed by the construction. In order to accomplish these objectives, it would be necessary to construct gravel support pads on which to install the concrete channel sections and to install a temporary surface bulkhead over the shaft. Additional and incidental work to be accomplished at this site consisted of removal of the shaft collar

and shaft timbers, as necessary. Other work consisted of installing a crushed limestone veneer over any exposed waste rock surfaces prior to backfilling of the perimeter of the precast concrete channel sections with topsoil, backfilling the excavation with topsoil, general site cleanup including minor finish-grading after the concrete cover was installed, and liming, mulching, fertilizing, and seeding of the area disturbed by the construction.

I. Orphan Boy Shaft

The plan at this site consisted of chainlink fence removal and replacement, installation of a prestressed concrete beam next to the fan house footing, placement of concrete channel sections over the air shaft and fan tube, and perform final site grading and cleanup. Also, it was anticipated that various above and below grade structures might be encountered. These structures were to be removed as necessary to install the concrete cap without disturbance to the fan house.

J. Downey Shaft Site

The reclamation plan included the excavation of two subsided areas believed to be associated with the Downey Shaft. The work required the excavation of the top 25 feet of the shafts, addition of water to promote consolidation of existing fill, refilling the top 25 feet of the shaft, general site cleanup, final grading, and site revegetation.

K. Moose Auraria Site

The plan at this site consisted of excavating the top 25 feet of the shaft, adding water to promote consolidation of existing fill, refilling the top 25 feet of the shaft, and general site cleanup including finish grading. A temporary surface bulkhead was required if the work could not be completed in one day.

L. Josephine Mine Site

The plan at this site consisted of excavating the top 25 feet of the shaft, adding water to promote consolidation of the existing fill, and refilling the top 25 feet of the shaft. A temporary surface bulkhead was required if the work could not be completed in one day.

M. Grout Lifting Ring Pockets

All concrete channels placed during this project were to have the pockets associated with the lifting rings filled with a non-shrink grout. In addition, six sites which were previously capped would require the grouting of lifting ring pockets under this contract. The six additional sites were the Original, Emma, Mary Louise No. 2, Bonanza Air, Ophir, and Diamond Shafts.

N. Spray Noxious Weeds

This planned item of work included the spraying of noxious weeds (spotted knapweed) on four designated maintenance sites. The spray was specified to be Tordon 22K at an application of 1/4 pound per acre. The designated sites were the Mary Louise No. 2, Bonanza Air, Ophir, and Clear Grit.

O. Colorado Mine Shaft Site

The proposed work involved the extension of an existing cap due to the potential of subsidence occurring along the eastern gravel pad. The extension would consist of a beam extended across the suspected void with the existing and new concrete channels supported on the beam. The extension was to be 19 L.F. to the east with the support beam located at the existing eastern gravel pad. Additional items of work included utility adjustments and general site grading and cleanup.

P. West Gagnon

This maintenance work called for repair of approximately 3 L.F. of asphalt curb, cover soil placement, site grading and cleanup, and site revegetation.

Q. Clear Grit

The reclamation plan called for the backfill of a shaft, removal of unsuitable rock from a riprapped channel, installation of reinforced concrete culvert pipe, reconstruction of drainage channels, knapweed spraying, and general site cleanup and revegetation.

R. Diamond

The Diamond Shaft was previously capped in 1986. Work under this contract called for site grading and interceptor ditch construction to direct runoff away from the existing cap. Lifting ring pockets were also to be grouted. No site revegetation work was proposed for this site.

4.2 Major Equipment List (based on information from Contractor)

<u>Type</u>	<u>Make/Model</u>	<u>Quantity</u>
Loader	International H-100C	1
Loader	Terex L-20	1
Loader/Hoe	Case 680CK	1
Excavator	Case 880	1
Crane	Austin-Western 410SR	2
Crane	Grove TMS475	1
Crane	P & H	1
Water Truck	GMC 9500 Series	1
Dump Truck	Ford LT 8000 Series	2
Dump Truck	GMC Brigadere	1
Grader	Galion T-500	1
Hydromulcher	(Unknown)	1
Seed Drill	Brillion "Sure-Stand"	1
Tractor	Waldon 5000	1

4.3 Contractor Employees

The Contractor generally had 3 full-time employees on-site. However, it was often limited to 2. Weed spraying and pavement replacement were the only

sub-contracted work other than material suppliers, i.e., limestone veneer and concrete panels and pipe suppliers.

4.4 Construction Activities

The Contractor began with the shaft flooding and backfill sites. The initial site was the Moose Auraria. Excavation exposed several wood timbers along with loose material which confirmed the shaft location. Water flooding resulted in rapid drainage in a northerly direction for a brief period of time only. The hole refused water after one (1) load of water at 3350 gallons. The shaft was backfilled with adjacent waste rock material. General site grading was completed which included shaping waste rock piles and mounding the shaft area. The work was completed as planned with the addition of some extra site excavation and grading to stockpile suitable cover soil and blend into an adjacent waste pile.

The Contractor was then directed to mobilize to the Britania Shaft under the authorization of the Department as described in Work Directive No. 1. This work was not initially proposed under this contract but was incorporated due to recent opening of the shaft. Also, a child was observed playing near the shaft opening which initiated immediate concern for public safety. Two holes were found open at the site. The larger was the actual shaft and was approximately 12'x10'x20' deep. The second hole was relatively small at 2' surface diameter with unknown depth. This smaller hole was suspected to be a shallow workings which had subsided. The Britania Shaft was flooded and backfilled. The smaller hole was covered with a steel grate. The area was fenced with a snow fence material and considered secure until proper shaft capping could be performed under the proposed Phase VII project. Backfill material was obtained from adjacent waste rock piles with consent from the surface and mineral owner, Montana Mining Properties.

The Contractor then resumed his contract by mobilizing to the designated Josephine site. The shaft location shown at the pre-bid was backfilled during EPA cleanup work. A subsided area to the east was substituted for this contract. This subsided area was adjacent to a frequently used dirt road and thus warranted exploration. Excavation revealed various items of trash and a few timbers. However, no shaft was found nor did water drain within the 20'± deep excavation hole. The debris was placed back in the hole and backfilled. The area was blended into the adjacent contours with no revegetation efforts.

The West Steward site resulted in the excavation of what appeared to be an access chute for a pipe gallery. No vertical shaft was found. The suspected shaft location was full of loose material adjacent to an east-west running 8'x8' timbered tunnel. Top of the tunnel was 7' below surface. The shaft excavation area was backfilled and material was also pushed up into the tunnels to prevent future subsidence. No revegetation work was performed here. The area was heavily infested with knapweed prior to any construction activities.

The Contractor then mobilized to the Downey site. Excavation was performed on two (2) locations which had surface subsidence. Both locations were indicative of backfilled shafts as each had deteriorated timbers and loose-easily excavated material. Flooding opened the holes and backfill material was

hydraulically flushed into the holes. Water was added until the shaft refused to drain further. Each shaft location received cover soil and was fertilized, seeded, and mulched. Additional cover soil was hauled from the Minnie Irvine source.

Following the relocation of a telephone pole guy anchor by U.S. West, the Contractor began shaft excavation at the Clear Grit. The shaft location was well defined by surface subsidence and easily excavated material. The shaft perimeter also had deteriorated timbers in scattered places at a depth of 14 feet. Bottom of shaft excavation was 20' prior to water flooding. The shaft drained water very rapidly, often faster than it could be supplied. Over 30,000 gallons of water were utilized to hydraulically flush and backfill the shaft voids. A temporary bulkhead was utilized on this shaft. Additional backfill material included on-site rock from the riprapped channel removal work and excess soil material from channel reconstruction work. Shaft backfilling was followed by final drainage channel improvements, installation of reinforced concrete pipe (RCP), borrow-ditch construction, and site grading and cleanup. Variations from the proposed plan involved the extension of 6 L.F. of RCP to maintain safe road width, extension of the borrow ditch, and realignment of riprap channels to more effectively control drainage and replace pavement over RCP installations to restore original site conditions. All disturbed areas were fertilized, seeded, and mulched except the borrow ditch area. EPA has plans to reclaim the overall area during the summer of 1991 which will incorporate this Clear Grit site.

Construction work at the Otisco Air Shaft proceeded as planned. The completed work included the removal of waste rock, demolishing and removal of the wood structure over shaft, shaft backfilling, site grading, and fertilizing, seeding, and mulching. Backfill material was hauled from the Otisco Shaft. A temporary bulkhead was utilized on this site. Following removal of the wood structure, the shaft was found to be in excellent condition. The timbers were not deteriorated. The opening was 6'x10' (inside face) with 8"x10" and 12"x10" wooden ties used for square sets. The walls were lined with 2"x10" boards. The upper set was removed which was 6 feet below to surface. Prior to backfilling activities, there was water in the shaft at the 60-foot level. This water appeared to be flowing to the southeast. Extensive quantities of water and backfill were used to fully backfill the vertical shaft. It was suspected that horizontal workings were also partially filled which would explain the rapid drop of 3-4 feet of material during the process of backfilling. The top of material was closely monitored as the backfill was placed. With the addition of each 14 C.Y. load of backfill, the top would suddenly drop as if the entire column of fill had shifted. The final backfill was completed without settlement. Continued monitoring would be advised here due to the unexpected presence of water in the mine shaft.

EPA cleanup work was performed around the Green Copper Shaft prior to this construction contract. As a result, additional work was required to salvage the 18" thick cover soil and veneer placed during EPA work. Also, additional veneer was hauled to the site to cover the immediate shaft area. The Green Copper Shaft did respond to water flooding. The shaft readily drained over 20,000 gallons of water and an additional 56 C.Y. of backfill from the Otisco Shaft. Shaft location was verified by the presence of timbers and a ladder. The site was graded but not revegetated by the Contractor. EPA committed to the revegetation

of this shaft area.

Following the Green Copper site work, Work Directive No. 2 was authorized to perform exploration and closure of a potential shaft opening at a local daycare house. The site was referred to as the Daycare located at 53 E. Center Street. Upon arrival, the situation was discussed with the Landowner, Kathy Davis. The hole was located in the northeast corner of the lot with a rope around the general area. A group of children were playing throughout the yard but were told by Kathy Davis to stay away from the roped area. There was a general depressed surface over an area of approximately 15'x25'. A definite hole extended through the recently placed grass/sod. The hole was only 1 foot in diameter but extended downward several feet. The generally broad depression was the primary concern at this site. Also, the property was a daycare center and a potential hazard did exist. In addition, sod was recently placed throughout the back yard but had not yet taken root. If quick action took place, the grass could be simply rolled back and replaced following completed excavation and backfill work activities.

Following miscellaneous consultations, the sod was rolled back, the hole was accessed with the excavator, and topsoil salvage work started. Once the topsoil was away from the suspected shaft area, the crew was directed to begin water flooding. The hole drained relatively quickly. As they washed the banks down and settled loose material, the problem became apparent. A large, 5-foot diameter, CMP was found off to the side of the suspected shaft with the bottom of the pipe completely corroded out. Water flooding drained directly into this pipe as well as the soils. It was immediately recognized that this was a city storm drain causing subsidence throughout the area in question. The City was contacted to come and observe the problem prior to backfilling.

Wally Choquette of Butte Metro arrived and decided to repair the pipe while it was exposed. This created a couple of hours of delay while the City repaired their pipe. Following pipe repair, the hole was backfilled and the Contractor replaced topsoil and sod.

The Humboldt Shaft was the first of the concrete capping sites the Contractor performed. The shaft location had been surveyed in with mining company coordinates. However, exploratory excavation was still performed to verify the shaft center. The actual center of shaft appeared to be 4-6 feet west of the reported coordinates as determined from visual observation of excavated timbers, a ladder, and ease of excavation. The A.C.M. coordinates fell on the east side of the shaft. The gravel pads were constructed as specified. Special care was taken in placing the concrete panels since a high voltage power line existed above the shaft. Utility company crews placed insulators over the wires. Eight concrete panels were placed with a typical cover area of 32'x27'. Limestone veneer and cover soil were placed and graded to match the top of the concrete cover. Additional site grading was performed to prevent drainage into the shaft area as existed prior to construction. The site was seeded by drill method, fertilized, and mulched.

The next shaft closure was the Otisco Shaft. Site work called for the excavation, haul, and stockpile of over 2000 C.Y. of waste rock. The material was considered hazardous waste and would be disposed of by means outside of this

Contract. This plan was not carried through as outside parties would no longer commit to disposing of the material. Therefore, an alternate plan was authorized to grade the material in place and position the concrete cap at a higher level than proposed. This prevented the need to remove any material from the Otisco Shaft other than material needed for backfill at the Otisco Air and Green Copper. This site grading replaced the excavation bid item and was performed under equipment rental rates. Final site drainage was in a northerly direction rather than to the south as proposed. Again, this substantially reduced excavation and retained a more natural drainage course. The gravel pads and concrete panels were oriented as specified in the plans. A monitoring port was prefabricated into the center panel and was closely centered over a wood post placed at the apparent center of the shaft. Limestone veneer, cover soil, and revegetation work were performed. The cover soil was obtained from Montana Resources (MR), located approximately 1.5 miles southeast of the site. Revegetation was performed with a spiked-tooth harrow to loosen the seedbed and incorporate fertilizer into the cover soil. Seeding was performed with the Brillion drill seeder followed by hydromulch with cellulose wood fiber. A tackifying agent was used on all hydromulch mixtures.

The Contractor then mobilized to the Benham Shaft. The initial area of existing pavement to be removed was based on the shaft center as determined by coordinates scaled from the original A.C.M. stope books. Coordinates were provided by Montana Mining Properties. Exploratory excavation verified that the shaft did exist at the described coordinates. Timbers were found outlining the shaft perimeter of 5'x9'. The top of the corner timbers was 27" below the pavement surface. The long dimension of the shaft was situated in an east-west direction. Necessary excavation was completed to accommodate the gravel pads, concrete cap, and 3" gravel base to be set below the pavement surface. Excess material was hauled off-site to the same location near the Kelley Mine Office where the Clear Grit waste was disposed. The plan called for dumping the excess material over the slope to the south of the Benham Shaft. However, a family residence located directly below the base of this slope suggested an alternative of hauling the material off-site. No material was disposed on-site. The basketball backboard structure was not in conflict with the shaft closure and was therefore not removed and reset as specified. Pavement was replaced at the required 2-inch thickness. All paving work was performed by Blankenship Construction, an approved sub-contractor. The pavement within the work area was cleaned with a water spray and all debris was removed from the site. No revegetation work was required here. Extra work involved the off-site disposal of excess material.

The next shaft closure was the Anselmo Air Shaft. At the suggestion of the Contractor, the existing concrete structure over the shaft was not removed as planned. Instead, the new concrete cover was placed over the top of the existing structure. This suggestion was implemented due to the potential of damaging the structural integrity of the shaft supports during the removal of the existing concrete structure and connected timber collar. Also, additional security would be provided by having the existing cover left intact. This alternative plan required additional embankment to be placed around the concrete panels. Side slopes were generally kept at a 2:1 or flatter. These embankment side slopes were then covered with a 1-1/2" lift of pavement. Details of the existing concrete structure and new concrete cap are described within the AS-

BUILT drawings. Other site work included welding of the steel doors on the concrete stack just east of the shaft. The site required no revegetation activities due to the asphalt surfacing. The site access gate was secured with a lock furnished by the Landowner, Montana Mining Properties.

The site grading and ditch work were completed at the Diamond Shaft with a change in general direction of site drainage. The interceptor ditches were constructed as planned. However, at the request of the surface and mineral owner, the general site drainage was directed in a southerly rather than easterly direction. This was primarily done to prevent runoff from eroding the steep side slopes of the large waste pile. By directing runoff to the south, water would basically drain around the waste pile slopes eventually draining to the toe of the described waste pile. No revegetation work was performed on this site.

The Orphan Boy site was the next shaft closure performed by the Contractor. This site required the capping of two (2) mine openings utilized for ventilation of the mine workings. Both shafts were closed as planned with minor modifications to the work plan. The main shaft, located adjacent to the south side of the fan house, involved the placement of a concrete beam against the fan house wall footing. This was necessary due to the shaft being directly adjacent to the fan house, prohibiting the standard gravel pad foundation. The fan house was salvaged as required. The resulting cap on the southern shaft was 32'x19'. This shaft had a water monitoring box and casing which was removed and salvaged by a representative of Montana Tech. The completed concrete shaft cover included a monitoring port so as the box could be reinstalled.

The second shaft was covered following the necessary removal over chain link fence, concrete footings, wooden drain structure, and miscellaneous steel obstructions such as anchor bolts. An existing steel plate cover over this shaft was left in place following consultation with the surface and mineral owner. The completed cap was up against the chainlink fence, resulting in a conflict with the gravel pad. A wooden retaining wall was placed against the fence to add stability to the gravel pad. All debris to be salvaged was in fact salvaged within the fenced area. The completed cap was a typical 32'x27' cover utilizing 8 concrete panels.

Excess material was disposed of adjacent to the site. The majority of material was simply graded to the south filling an old road cut within the existing mine waste pile. Approximately 50 C.Y. of material were placed on the west face of the existing waste pile. The overall site was cleaned up and the access gate to the second shaft was locked by the owner.

The final shaft closure was the Eveline Shaft which was not initially part of this contract. This shaft closure was authorized by the Department due to a high hazard it created following an attempted backfill during EPA cleanup work. The shaft backfill had bridged with a steel beam at a 10-15 foot level below the surface. Arrangements were made by the Department to utilize the existing concrete panels stockpiled next to the Moose Shaft. Completed site work included the removal and disposal of 42 C.Y. of waste and debris excavated from the shaft area. Gravel pads were constructed to a grade which would result in the concrete panels being flush with the final surface. The concrete panels were loaded and transported from the Moose Shaft and placed over the Eveline Shaft. Cover soil

and limestone veneer were salvaged and replaced. A temporary bulkhead and fencing were utilized on this site during the closure activities. No revegetation work was required as the EPA cleanup was to perform overall site revegetation activities following shaft closure.

Noxious weed spraying was completed by an approved sub-contractor, Pioneer Weed Control. The areas sprayed were heavily infested with knapweed but subsequent observation of the plants indicated a successful spray application. Tordon 22K was used as specified other than on areas close to trees or large shrubs such as the Mary Louise site. In that instance, 2.4-D-4# Amine and Stinger were utilized to prevent damage to trees or shrub growth. An additional area north of the Clear Grit was sprayed as directed by the Department.

All new concrete covers and the specified existing covers with lifting rings were grouted. The ease at which this filler can be removed is yet to be determined. Subsequent observation indicates that it will chip out without too much problem.

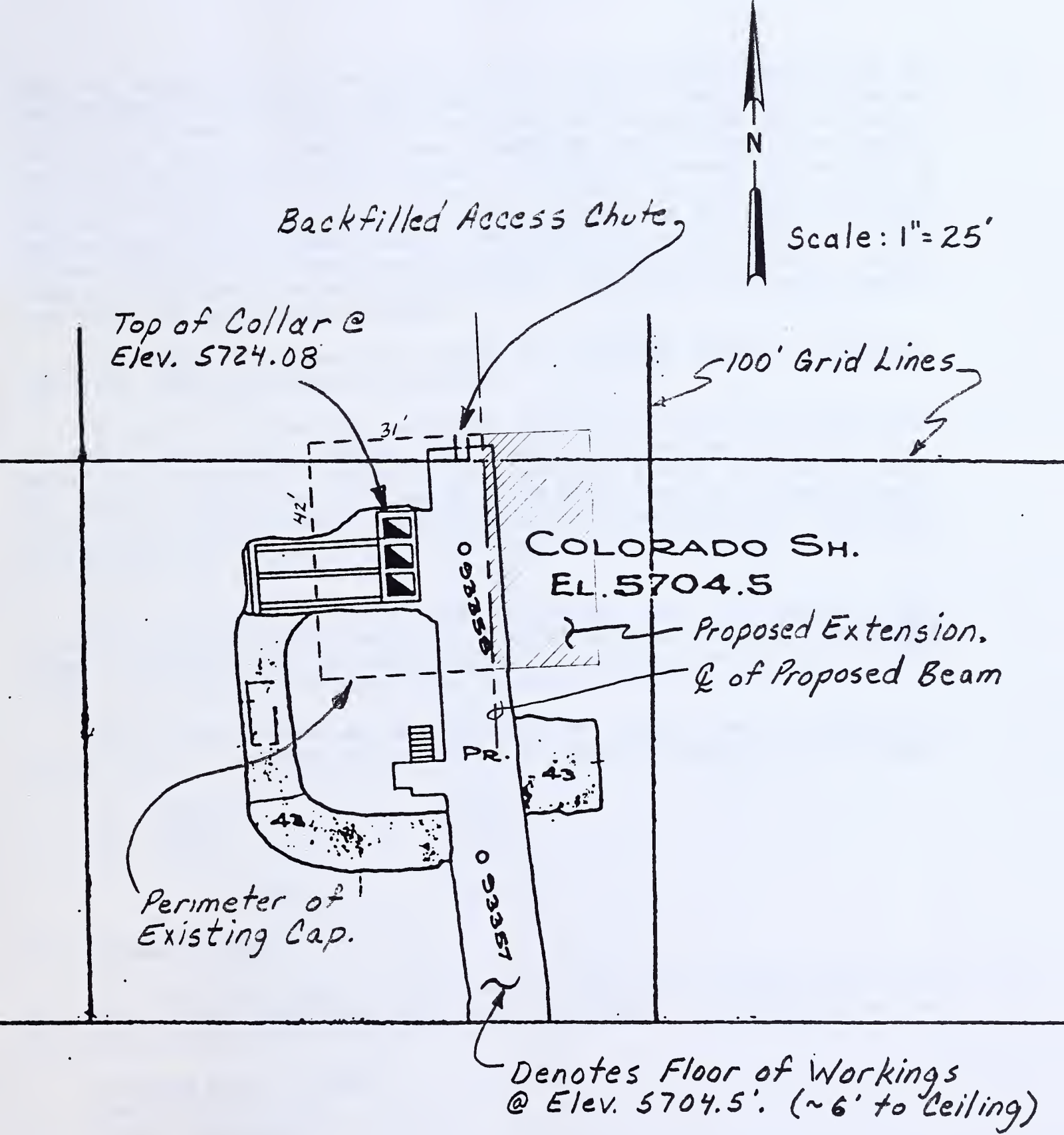
The proposed work at the Heavy Mine Site was dropped from this Contract. EPA cleanup work backfilled these shafts and removed any immediate need for hazard mitigation.

Also, the proposed cover extension at the Colorado Shaft was not performed. Additional site investigation suggested that the proposed extension was not appropriate nor warranted. The proposed extension was based on problems of subsidence occurring on the northeast corner of the existing cap. It was anticipated during design phases that this subsidence would continue all along the eastern gravel pad. Further site investigation was initiated for a number of reasons including insufficient documentation of site investigation findings and on-site conditions, i.e., existing channel dimensions conflicted with the Plans.

Further investigation performed during this Contract involved the removal of 4 existing channels on the northern side of the existing cover. This was the general area reported to be subsiding. The shaft collar was found to be well intact and backfilled. A minor subsidence existed directly north of the shaft collar. This area was excavated by the Contractor. It proved to be a pipe gallery with various steel pipes running in a north-south direction. Wood timbers were hit at a depth of 3' below the concrete collar with pipes situated at a 6-8' depth. This excavated area was backfilled and not considered a threat to the eastern gravel pads.

The northeast corner of the existing cover was also excavated. The area had obviously been backfilled in the past as reported. No subsidence was observed along the eastern gravel pads. The disturbed pads were reconstructed and the concrete channels replaced.

To learn more about the underground workings at the Colorado Shaft, the mining company stope books were reviewed by the construction inspector. Book L-27, located at Montana Resource, Inc., contained drawings of the workings located approximately 20' below the surface. (See attached drawing)



COLORADO SHAFT WORKINGS

What was learned was that the problem area at the northeast corner of the cap was the result of a vertical access chute. This chute is now backfilled but was initially 20' deep. The proposed beam support was located over the workings at the 20 foot level. In summary, it was recommended that this particular plan for extension be deleted from this Contract. In order to prevent all possibility of subsidence under the cover supports, a much larger extension would be necessary. However, since the access chute is backfilled and is of a relatively shallow depth, this northeast corner should not be a serious problem. As for the workings parallel to the gravel pad, these are reported to be well supported tunnels with concrete and wood lining/support. There was no indication that the area above the workings had subsided.

The site was graded and cleaned up following channel replacement. Fertilizer, seed, and mulch were applied.

Disposal of potentially hazardous material off-site was avoided when reasonably able to do so. However, conditions did warrant the disposal of excess material to an off-site location on the Clear Grit, Benham, and Eveline Shaft. The material removed from the Clear Grit and Benham went to a common disposal site. This site was located directly across the Anaconda Road from the Montana Mining Properties' office facility. The material was placed within a broad, flat area adjacent to the Berkeley Pit.

As for the Eveline material, the soils were placed in the generally same location as the EPA cleanup work placed excess material from the same Eveline site. The disposal area is directly north of the Moose Shaft across the main road. The material is adjacent to the Berkeley Pit.

Both disposal areas were utilized with the consent from the controlling mining company. A summary of the volumes of material disposed is as follows:

1. Clear Grit	120 C.Y.
2. Benham	28 C.Y.
3. Eveline	<u>42 C.Y.</u>
TOTAL	190 C.Y.

4.5 Quantities Used

The final pay request is Attachment 3. This report contains the list of all final project quantities and costs. A summary of shaft closures and maintenance sites is as follows:

Concrete Caps - 7 Shafts
Backfills - 9 Shafts
General Maintenance - 10 Sites

5. PAYMENT REQUESTS

5.1 Final Pay Request - See Attachment 3.

5.2 Cost Per Site

<u>Site Name</u>	<u>Amount</u>
1. Otisco	\$ 18,457.68
2. Otisco Air	4,480.00
3. Benham Mine	13,692.25
4. Anselmo Air	14,883.50
5. West Steward	869.00
6. Green Copper	2,750.00
7. Heaney	0.00 (site work deleted)
8. Humboldt	14,963.63
9. Orphan Boy	26,831.52
10. Downey	3,009.00
11. Moose Auraria	1,188.50
12. Josephine	917.75
13. Grout Lifting Pockets	1,200.00
a. Original	200.00
b. Emma	200.00
c. Mary Louise No.2	200.00
d. Bananza Air	200.00
e. Ophir	200.00
f. Diamond	200.00
14. Spray Noxious Weeds	4,360.00
a. Mary Louse No.2	120.00
b. Bananza Air	1,120.00
c. Ophir	240.00
* d. Clear Grit	2,880.00

* Includes additional 4.5 acres to north of Clear Grit.

15. Colorado Site	2,597.86
16. West Gagnon	484.00
17. Clear Grit	13,390.79
18. Diamond	2,805.00
19. Britania (W.D.#1)	736.63
20. 55 E. Center St. (W.D. #2)	1,234.47
21. Eveline	10,450.00
22. Minnie Irvine	117.00

5.3 Total Project Cost

Total cost for the project was \$154,418.58. (Includes temporary bulkhead and mobilization)

6. PROJECT SUMMARY

6.1 Summary of Project

The reclamation work was completed in 72 calendar days which was 12 days

beyond the original 60-day proposal. The added days were credited to the additional work performed during this Contract. The total project cost of \$154,418.58 was 94.7% of the original contract award.

The Contractor performed the work as specified and directed with a high level of workmanship. Skinner Enterprises was extremely cooperative throughout the project. Safety and exposure to potentially hazardous material were considered on a regular basis. Necessary precautions were taken during the construction work to protect public safety and health.

The success of this reclamation project would not have been possible without the consistent cooperation from Rob Jordan of Montana Mining Properties and Tom Malloy of New Butte Mining. All individuals directly involved in the construction appreciate the time and efforts of Montana Mining Properties and New Butte Mining in providing needed information, advising, and necessary consents.

6.2 Site Condition After Completion

The reclamation work was completed as described and illustrated on the AS-BUILT drawings. The work was well documented with numerous photographs. The Landowners were pleased with the final results and were kept well informed. The success of the revegetation work will not be known until several growing seasons have passed.

6.3 As-Built Drawings

See Attachment 5.

6.4 Maintenance or Follow-up

All shaft closures performed under this Contract will require monitoring of future surface hazards and revegetation. Work performed during the Phase VI Project did not necessarily include the backfilling of all subsurface mine workings. It is possible that further deterioration of various mine-related supports could create new surface hazards in the future.

Also, many of the shaft closures to date have not been well marked or documented so the shaft could be relocated. This is primarily in regards to backfill-type shaft closures. Many of the backfilled shafts within this project were tied to adjacent features for future reference. These shafts have a location map sketched on the AS-BUILT drawings.

7. COMMENTS/SUGGESTIONS

Precaution should be taken to avoid placing a high percentage of fine-grained materials into shaft backfills. A common problem encountered was a muck material floating to the top of the shaft during final backfill. By incorporating uniform sized rock to help stabilize and hold saturated fine-grained backfill within the rock voids, this problem can be avoided.

All shafts should be marked with a location stake prior to construction and preferably prior to a pre-bid showing. This will define potential conflicts due to power lines, steep slopes, etc. Permanent marking of all backfilled shafts should be seriously considered.

8. PHOTOGRAPHS/SLIDES

8.1 Listing

See Attachment 6.

8.2 Photo Location Map

Photograph locations are noted on the photograph description sheet.

8.3 Photos/Slides

See Attachment 6.

ATTACHMENT 1

BID TABULATIONS

BID TABULATION

DATE OF BID OPENING: June 14, 1990

PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI

PROJECT NO.: DSL/ AMRB 90-007

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE		Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
	ALL SITES										
1	Mobilization	L.S.	1.0	8150.00	8150.00	10000.00	10000.00	15000.00	15000.00	30000.00	30000.00
2	Temporary Surface Bulkhead	L.S.	1.0	500.00	500.00	5000.00	5000.00	1000.00	1000.00	4852.25	4852.25
	SCHEDULE 1										
	Otisco Shaft										
1	Excavation	C.Y.	2100.0	2.50	5250.00	2.00	4200.00	1.50	3150.00	1.85	3885.00
2	Gravel Pads	L.S.	1.0	750.00	750.00	500.00	500.00	500.00	500.00	1095.00	1095.00
3	Precast Concrete Channel										
	Sections - 27'	EACH	10.0	1400.00	14000.00	1000.00	10000.00	850.00	8500.00	1193.00	11930.00
4	Grading & Cleanup	ACRE	0.8	600.00	480.00	1000.00	750.00	1600.00	1200.00	955.00	716.25
5	Cr. Limestone Veneer	TONS	225.0	35.00	7875.00	25.00	5625.00	30.00	6750.00	48.65	10946.25
6	Provide Cover Soil	C.Y.	1500.0	4.00	6000.00	2.50	3750.00	3.50	5250.00	5.95	8925.00
7	Mulching	LBS.	2250.0	0.35	787.50	0.20	450.00	0.40	900.00	0.38	855.00
8	Fertilizing	LBS.	231.0	1.30	300.30	2.00	462.00	1.60	369.60	1.63	376.53
9	Seeding	LBS.	15.0	20.00	300.00	20.00	300.00	11.00	165.00	11.33	169.95
Total - Schedule 1					35712.80		26037.00		26784.60		38898.98

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE		Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
	SCHEDULE 2										
	Otisco Air Shaft										
1	Backfill Shaft	C.Y.	170.0	9.00	1530.00	8.00	1360.00	12.00	2040.00	3.65	620.50
2	Provide Water	GALS	10000.0	0.03	300.00	0.04	400.00	0.05	500.00	0.05	500.00
3	Grading & Cleanup	ACRE	0.1	1000.00	50.00	6000.00	300.00	5000.00	250.00	955.00	47.75
4	Lime	TON	1.0	50.00	50.00	300.00	300.00	760.00	760.00	790.65	790.65
5	Seed	LBS.	1.0	20.00	20.00	100.00	100.00	11.00	11.00	11.33	11.33
6	Fertilizer	LBS.	15.0	1.30	19.50	4.00	60.00	1.60	24.00	1.63	24.45
7	Mulch	LBS.	150.0	0.35	52.50	0.50	75.00	0.40	60.00	0.33	49.50
	Total - Schedule 2				2022.00		2595.00		3645.00		2044.18
	SCHEDULE 3										
	Benham Mine Site										
1	Backhoe	HRS.	4.0	60.00	240.00	75.00	300.00	125.00	500.00	67.50	270.00
2	Remove & Replace Pavement										
		S.Y.	128.0	5.50	704.00	15.00	1920.00	20.00	2560.00	35.00	4480.00
3	Gravel Pads	L.S.	1.0	750.00	750.00	500.00	500.00	500.00	500.00	1095.00	1095.00
	SUBTOTAL - This Schedule				1694.00		2720.00		3560.00		5845.00

BID TABULATION

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE				Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
4	Precast Concrete Channel												
	Sections - 27'	EACH	10.0	1400.00	14000.00	1000.00	10000.00	850.00	8500.00	1193.00	11930.00		
5	Compacted Backfill	C.Y.	100.0	5.00	500.00	5.00	500.00	15.00	1500.00	3.65	365.00		
6	Remove & Reinstall Basket												
	ball Backboard & Appur-												
	tenances	L.S.	1.0	100.00	100.00	200.00	200.00	750.00	750.00	250.00	250.00		
	Total - Schedule 3				16294.00		13420.00		14310.00		18390.00		
	SCHEDULE 4												
	Anselmo Air Shaft												
1	Remove & Dispose of Exist												
	ing Concrete Cap	L.S.	1.0	500.00	500.00	1500.00	1500.00	2000.00	2000.00	1473.00	1473.00		
2	Gravel Pads	L.S.	1.0	1000.00	1000.00	500.00	500.00	500.00	500.00	1092.00	1092.00		
3	Precast Concrete Channel												
	Sections - 27'	EACH	10.0	1820.00	18200.00	1000.00	10000.00	850.00	8500.00	1193.00	11930.00		
4	Weld Steel Door	L.S.	1.0	200.00	200.00	100.00	100.00	250.00	250.00	75.00	75.00		
5	Grading & Cleanup	ACRE	0.2	600.00	120.00	1000.00	200.00	2500.00	500.00	5000.00	1000.00		
SUBTOTAL - This Schedule					20020.00		12300.00		11750.00		15570.00		

BID TABULATION

DATE OF BID OPENING: June 14, 1990
PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI
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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE		Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
6	Liming	TON	1.0	50.00	50.00	300.00	300.00	760.00	760.00	790.65	790.65
7	Mulching	LBS.	600.0	0.35	210.00	0.25	150.00	0.40	240.00	0.38	228.00
8	Fertilizing	LBS.	62.0	1.30	80.60	2.00	124.00	1.60	99.20	1.63	101.06
9	Seeding	LBS.	4.0	20.00	80.00	20.00	80.00	11.00	44.00	11.33	45.32
	Total - Schedule 4				20440.60		12954.00		12893.20		16735.03
	SCHEDULE 5										
	West Stewart Site										
1	Backhoe	HRS.	4.0	60.00	240.00	75.00	300.00	125.00	500.00	67.50	270.00
2	Backfill Shaft	C.Y.	100.0	9.00	900.00	5.00	500.00	15.00	1500.00	3.65	365.00
3	Provide Water	GALS	10000.0	0.03	300.00	0.04	400.00	0.05	500.00	0.05	500.00
	Total - Schedule 5				1440.00		1200.00		2500.00		1135.00
	SCHEDULE 6										
	Green Copper Mine Site										
1	Backhoe	HRS.	4.0	60.00	240.00	75.00	300.00	125.00	500.00	67.50	270.00
2	Backfill Shaft	C.Y.	100.0	9.00	900.00	5.00	500.00	15.00	1500.00	3.65	365.00
	SUBTOTAL - This Schedule				1140.00		800.00		2000.00		635.00

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE			Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
3	Provide Water	GALS	10000.0	0.03	300.00		0.04	400.00	0.05	500.00	0.05	500.00
	Total - Schedule 6				1440.00			1200.00		2500.00		1135.00
	SCHEDULE 7											
	Heaney Mine Site											
1	Backhoe	HRS.	12.0	60.00	720.00		75.00	900.00	125.00	1500.00	67.50	810.00
2	Backfill Shaft	C.Y.	300.0	9.00	2700.00		5.00	1500.00	15.00	4500.00	3.65	1095.00
3	Provide Water	GALS	30000.0	0.03	900.00		0.04	1200.00	0.03	900.00	0.05	1500.00
4	Move Waste Rock Dump	HRS.	4.0	60.00	240.00		100.00	400.00	200.00	800.00	100.00	400.00
	Total - Schedule 7				4560.00			4000.00		7700.00		3805.00
	SCHEDULE 8											
	Humboldt Shaft											
1	Gravel Pads	L.S.	1.0	750.00	750.00		1500.00	1500.00	500.00	500.00	1097.00	1097.00
2	Precast Concrete Channel											
	Sections - 27'	EACH	10.0	1400.00	14000.00		1000.00	10000.00	850.00	8500.00	1193.00	11930.00
3	Grading & Cleanup	ACRE	0.1	1000.00	100.00		2000.00	200.00	7500.00	750.00	955.00	95.50
	SUBTOTAL - This Schedule				14850.00			11700.00		9750.00		13122.50

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE			Skinner Enterprises Helena, Mt.			Gilman Excavation Butte, Mt.			Bozeman Sand & Gravel Bozeman, Mt.		
				UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST	
4	Cr. Limestone Veneer	TONS	30.0	50.00	1500.00		25.00	750.00		30.00	900.00		48.65	1459.50	
5	Provide Cover Soil	C.Y.	200.0	4.00	800.00		5.00	1000.00		5.00	1000.00		5.95	1190.00	
6	Mulching	LBS.	300.0	0.35	105.00		0.25	75.00		0.40	120.00		0.38	114.00	
7	Fertilizer	LBS.	30.0	1.30	39.00		2.00	60.00		1.60	48.00		1.63	48.90	
8	Seeding	LBS.	2.0	20.00	40.00		20.00	40.00		11.00	22.00		11.33	22.66	
	Total - Schedule 8				17334.00			13625.00			11840.00			15957.56	
	SCHEDULE 9														
	Orphan Boy Shaft														
1	Remove & Replace Chain														
	Link Fence	L.F.	50.0	10.00	500.00		5.00	250.00		30.00	1500.00		3.00	150.00	
2	Remove Below Grade Structures:														
	Foreman	HRS.	12.0	35.00	420.00		35.00	420.00		35.00	420.00		32.00	384.00	
	General Labor	HRS.	12.0	25.00	300.00		35.00	420.00		25.00	300.00		21.00	252.00	
	D-8 Crawler Tractor	HRS.	6.0	150.00	900.00		100.00	600.00		95.00	570.00		110.00	660.00	
	Backhoe	HRS.	4.0	60.00	240.00		75.00	300.00		75.00	300.00		85.00	340.00	
	SUBTOTAL - This Schedule				2360.00			1990.00			3090.00			1786.00	

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PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE		Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
	Front-End Loader(6 CY)	HRS.	2.0	85.00	170.00	75.00	150.00	75.00	150.00	76.00	152.00
	Compressor (100 CFM)	HRS.	6.0	30.00	180.00	30.00	180.00	15.00	90.00	32.50	195.00
	Compactor	HRS.	4.0	20.00	80.00	50.00	200.00	55.00	220.00	30.00	120.00
	Gravel Backfill	C.Y.	24.0	15.00	360.00	20.00	480.00	5.00	120.00	15.60	374.40
3	Precast Concrete Channel										
	Sections										
	a. 19' Long	EACH	10.0	1000.00	10000.00	800.00	8000.00	650.00	6500.00	845.00	8450.00
	b. 27' Long	EACH	10.0	1400.00	14000.00	1000.00	10000.00	850.00	8500.00	1193.00	11930.00
4	Gravel Pads	L.S.	1.0	1500.00	1500.00	1000.00	1000.00	750.00	750.00	1365.00	1365.00
5	Prestressed Concrete Box										
	Beam	L.F.	45.0	40.00	1800.00	100.00	4500.00	75.00	3375.00	182.50	8212.50
6	Grading & Cleanup	ACRE	0.3	600.00	150.00	1000.00	250.00	3200.00	800.00	955.00	238.75
	Total - Schedule 9				30600.00		26750.00		23595.00		32823.65
	SCHEDULE 10										
	Downey Shaft Site										
1	Backhoe	HRS.	4.0	60.00	240.00	75.00	300.00	125.00	500.00	67.50	270.00
SUBTOTAL - This Schedule					240.00		300.00		500.00		270.00

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE		Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
2	Backfill Shaft	C.Y.	150.0	9.00	1350.00	5.00	750.00	15.00	2250.00	3.65	547.50
3	Provide Water	GALS	15000.0	0.03	450.00	0.04	600.00	0.05	750.00	0.05	750.00
4	Grading & Cleanup	ACRE	0.1	1000.00	100.00	2000.00	200.00	7500.00	750.00	955.00	95.50
5	Liming	TON	2.0	50.00	100.00	300.00	600.00	760.00	1520.00	790.65	1581.30
6	Mulching	LBS.	300.0	0.35	105.00	0.25	75.00	0.40	120.00	0.38	114.00
7	Fertilizer	LBS.	31.0	1.30	40.30	2.00	62.00	1.60	49.60	1.63	50.53
8	Seeding	LBS.	2.0	20.00	40.00	20.00	40.00	11.00	22.00	11.33	22.66
	Total - Schedule 10				2425.30		2627.00		5961.60		3431.49
	SCHEDULE 11										
	Moose Auraria Mine Site										
1	Backhoe	HRS.	4.0	60.00	240.00	75.00	300.00	125.00	500.00	67.50	270.00
2	Provide Water	GALS	10000.0	0.03	300.00	0.04	400.00	0.05	500.00	0.05	500.00
3	Backfill Shaft	C.Y.	100.0	9.00	900.00	5.00	500.00	15.00	1500.00	3.65	365.00
	Total - Schedule 11				1440.00		1200.00		2500.00		1135.00

BID TABULATION

DATE OF BID OPENING: June 14, 1990
PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI
PROJECT NO.: DSL/ AMRB 90-007

L.C.Hanson Co.

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PROJECT NO.: DSL/ AMKB 90-007				ENGINEER'S ESTIMATE				Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
SCHEDULE 12													
Josephine Mine Site													
1	Backhoe	HRS.	4.0	60.00	240.00	75.00	300.00	125.00	500.00	67.50	270.00		
2	Provide Water	GALS	10000.0	0.03	300.00	0.04	400.00	0.05	500.00	0.05	500.00		
3	Backfill Shaft	C.Y.	100.0	9.00	900.00	5.00	500.00	15.00	1500.00	3.65	365.00		
	Total - Schedule 12				1440.00		1200.00		2500.00		1135.00		
SCHEDULE 13													
Grout Lifting Ring Pockets (6 Sites)													
1	Original	L.S.	1.0	150.00	150.00	200.00	200.00	500.00	500.00	285.00	285.00		
2	Emma	L.S.	1.0	210.00	210.00	200.00	200.00	500.00	500.00	285.00	285.00		
3	Mary Louise No. 2	L.S.	1.0	195.00	195.00	200.00	200.00	500.00	500.00	285.00	285.00		
4	Bonanza Air	L.S.	1.0	150.00	150.00	200.00	200.00	500.00	500.00	285.00	285.00		
5	Ophir	L.S.	1.0	195.00	195.00	200.00	200.00	500.00	500.00	285.00	285.00		
6	Diamond	L.S.	1.0	540.00	540.00	200.00	200.00	1000.00	1000.00	965.00	965.00		
Total - Schedule 13					1440.00		1200.00		3500.00		2390.00		

BID TABULATION

DATE OF BID OPENING: June 14, 1990
PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI
PROJECT NO.: DSL/ AMRB 90-007

L.C.Hanson Co.

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE			Skinner Enterprises Helena, Mt.			Gilman Excavation Butte, Mt.			Bozeman Sand & Gravel Bozeman, Mt.		
				UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST	
	SCHEDULE 14														
	Spray Noxious Weeds														
1	Mary Louise No. 2	ACRE	0.2	500.00	100.00		600.00	120.00		75.00	15.00		50.00	10.00	
2	Bonanza Air	ACRE	1.0	500.00	500.00		400.00	400.00		75.00	75.00		50.00	50.00	
3	Ophir	ACRE	0.1	500.00	50.00		600.00	60.00		75.00	7.50		50.00	5.00	
4	Clear Grit	ACRE	2.5	500.00	1250.00		400.00	1000.00		75.00	187.50		50.00	125.00	
	Total - Schedule 14				1900.00			1580.00			285.00			190.00	
	SCHEDULE 15														
	Colorado Site														
1	Remove & Replace Existing														
	Precast Concrete Channels	EACH	7.0	200.00	1400.00		500.00	3500.00		215.00	1505.00		235.00	1645.00	
2	Precast Concrete Channels	EACH	13.0	1000.00	13000.00		1000.00	13000.00		650.00	8450.00		1193.00	15509.00	
3	Prestressed Concrete Box														
	Beam	L.F.	120.0	135.00	16200.00		80.00	9600.00		70.00	8400.00		168.38	20205.60	
4	Gravel Pads	L.S.	1.0	1000.00	1000.00		1000.00	1000.00		500.00	500.00		1095.00	1095.00	
5	Grading & Site Cleanup	ACRE	0.1	1000.00	100.00		2000.00	200.00		5000.00	500.00		955.00	95.50	
	SUBTOTAL - This Schedule				31700.00			27300.00			19355.00			38550.10	

BID TABULATION

DATE OF BID OPENING: June 14, 1990
PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI
PROJECT NO.: DSL/ AMRB 90-007

L.C.Hanson Co.

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE			Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman, Mt.	
				UNIT COST	TOTAL ITEM COST		UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
6	Utility Adjustments	L.S.	1.0	1000.00	1000.00		300.00	300.00	500.00	500.00	750.00	750.00
	Total - Schedule 15				32700.00			27600.00		19855.00		39300.10
	SCHEDULE 16											
	West Gagnon											
1	Curb Repair	L.F.	1.0	100.00	100.00		50.00	50.00	500.00	500.00	50.00	50.00
2	Site Grading	ACRE	0.1	1000.00	50.00		2000.00	100.00	5000.00	250.00	955.00	47.75
3	Provide Cover Soil	C.Y.	10.0	4.00	40.00		20.00	200.00	25.00	250.00	20.00	200.00
4	Mulching	LBS.	150.0	0.35	52.50		0.20	30.00	0.50	75.00	0.38	57.00
5	Fertilizing	LBS.	15.0	1.30	19.50		2.00	30.00	2.25	33.75	1.63	24.45
6	Seeding	LBS.	1.0	20.00	20.00		20.00	20.00	15.00	15.00	11.33	11.33
	Total - Schedule 16				282.00			430.00		1123.75		390.53
	SCHEDULE 17											
	Clear Grit											
1	Backhoe	HRS.	4.0	60.00	240.00		75.00	300.00	125.00	500.00	67.50	270.00
2	Backfill Shaft	C.Y.	100.0	9.00	900.00		5.00	500.00	15.00	1500.00	3.65	365.00
	SUBTOTAL - This Schedule				1140.00			800.00		2000.00		635.00

BID TABULATION

DATE OF BID OPENING: June 14, 1990
PROJECT NAME: BUTTE SHAFTS PROJECT - PHASE VI
PROJECT NO.: DSL/ AMRB 90-007

L.C.Hanson Co.

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	ENGINEER'S ESTIMATE			Skinner Enterprises Helena, Mt.		Gilman Excavation Butte, Mt.		Bozeman Sand & Gravel Bozeman	
				UNIT COST	TOTAL ITEM COST	UNIT COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST	UNIT COST	TOTAL ITEM COST
3	Provide Water	GALS	10000.0	0.03	300.00	0.04	400.00	0.05	500.00	0.05	500.00	
4	Riprap Channel Improve- ments	L.F.	175.0	20.00	3500.00	5.00	875.00	8.60	1505.00	3.00	525.00	
5	Culvert - 18" Dia. RCP	L.F.	84.0	20.00	1680.00	40.00	3360.00	36.00	3024.00	19.35	1625.40	
6	Construct Roadway Borrow Ditch	L.F.	300.0	7.50	2250.00	5.00	1500.00	2.50	750.00	2.50	750.00	
7	Excavation	C.Y.	100.0	5.00	500.00	5.00	500.00	5.00	500.00	3.65	365.00	
8	Site Grading & Cleanup	ACRE	0.2	1000.00	200.00	2000.00	400.00	5000.00	1000.00	955.00	191.00	
9	Liming	TONS	1.0	50.00	50.00	300.00	300.00	760.00	760.00	790.65	790.65	
10	Mulching	LBS.	600.0	0.35	210.00	0.25	150.00	0.40	240.00	0.38	228.00	
11	Fertilizing	LBS.	62.0	1.30	80.60	2.00	124.00	1.60	99.20	1.63	101.06	
12	Seeding	LBS.	4.0	20.00	80.00	20.00	80.00	11.00	44.00	11.33	45.32	
	Total - Schedule 17				9990.60		8489.00		10422.20		5756.43	
	SCHEDULE 18											
	Diamond											
1	Site Grading	ACRE	1.0	600.00	600.00	1000.00	1000.00	1500.00	1500.00	955.00	955.00	
2	Interceptor Ditch	L.F.	200.00	2.00	400.00	5.00	1000.00	7.50	1500.00	4.00	800.00	
	Total - Schedule 18				1000.00		2000.00		3000.00		1755.00	

ATTACHMENT 2

CHANGE ORDERS

CHANGE ORDER

ORDER NO: One (1)

PROJECT TITLE: BUTTE SHAFTS, PHASE 6

MONT A/E or DSL-AMRB: 90-007

CONTRACT DATE: July 3, 1990

OWNER: Montana Department of State Lands - AMR Bureau

CONTRACTOR: Skinner Enterprises PO Box 5447 Helena, MT 59604

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
	(SEE ATTACHED SHEETS FOR DESCRIPTION AND COSTS OF CHANGES)						
TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.						-\$ 8,688.42	
OVERHEAD & PROFIT @ <u>Incl</u> %							
GRAND TOTAL - THIS CHANGE ORDER						-\$ 8,688.42	

Original Contract Price	\$ 163,107.00
Current Contract Price Adjusted by Previous Change Order	0.00
Cost this Change Order (+ or -)	-\$ 8,688.42
New Contract Price including this Change Order	\$ 154,418.58

RECEIVED

DEC 11 1990

L. C. HANSON CO.

The completion date as set forth in the Contract Documents shall be ~~(unchanged, increased, decreased)~~
by 12 calendar days.

The date for completion of all work will be November 1, 1990.

Description and Justification for Change:

1. Work performed under Work Directives No. 1 and No. 2 consisted of closing hazardous surface openings. Work was directed to be performed by Department personnel.
2. Supplemental work performed at various project sites was required to complete the reclamation and to address additional problems encountered during the course of the work.
3. The EVALINE SHAFT was uncovered during E.P.A. work under another Contract. The Department directed the closure of this shaft with panels that were stockpiled at the MOOSE SHAFT in Walkerville.
4. Reconciliation of Final Quantities - The actual quantities shown were necessary to meet the field conditions encountered during construction.

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by \$_____ (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by \$_____ (100% of the Change Order amount).

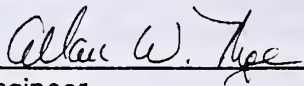
COUNTERSIGNED BY MONTANA
RESIDENT AGENT

SURETY

CONTINENTAL CASUALTY COMPANY

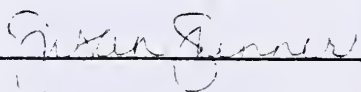
By: 

Seal

Recommended by: L.C. HARRISON CO. 
Engineer

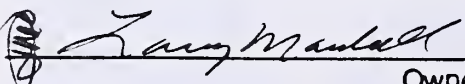
11/21/90

Date

Accepted by:  - SUNKER ENT.
Contractor

11-21-90

Date

Approved by: 
Owner

12/6/90

Date

COST OF CHANGES

DESCRIPTION	QUANTITY	MAT'LS	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	TOTAL COST
<u>WORK DIRECTIVE CHANGE NO. 1</u>							
BRITANIA SHAFT							
a. TEREX L-20 LOADER	5 HRS	----	INCL.	50.00	----	50.00	\$ 250.00
b. PROVIDE WATER	5000 GALS	0.04	----	INCL.	----	0.04	200.00
c. LABORERS	7.5 HRS	----	26.19	----	----	26.19	196.43
d. METAL FENCE POSTS	10 EACH	2.58	----	----	----	2.58	25.80
e. FENCE MATERIALS	2 EACH	32.20	----	----	----	32.20	64.40
Sub-Total							\$ 736.63
<u>WORK DIRECTIVE CHANGE NO. 2</u>							
55 E. CENTER STREET							
a. CASE 680C LOADER/BKHOE	6 HRS	----	INCL.	55.00	----	55.00	\$ 330.00
b. LABORERS	32.8 HRS	----	26.19	----	----	26.19	857.72
c. BURLAP	1 LUMP SUM	1.0	----	----	----	46.75	46.75
Sub-Total							\$1234.47
<u>SUPPLEMENTAL WORK</u>							
SCHEDULE 1 - OTISCO SHAFT							
a. TEREX L-20 LOADER	6 HRS.	----	INCL.	50.00	----	50.00	\$ 300.00
b. GALION T-500 GRADER	4 HRS.	----	INCL.	61.57	----	61.57	246.28
c. PROVIDE WATER	10050 GALS	0.04	----	INCL.	----	0.04	402.00
Sub-Total							\$ 948.28
SCHEDULE 2 - OTISCO AIR SHAFT							
a. COVER SOIL	30 C.Y.	7.00	----	----	----	7.00	210.00
Sub-Total							\$ 210.00
SCHEDULE 3 - BENHAM MINE SITE							
a. FORD LT 9000 DUMP TRK	2.5 HRS	----	INCL.	50.00	----	50.00	\$ 125.00
b. TEREX L-20 LOADER	3 HRS	----	INCL.	50.00	----	50.00	150.00
d. PROVIDE WATER	3350 GALS	0.04	----	INCL.	----	0.04	134.00
Sub-Total							\$ 409.00
SCHEDULE 4 - ANSELMO AIR SHAFT							
a. FORD LT 9000 DUMP TRK	9 HRS	----	INCL.	50.00	----	50.00	\$ 450.00
b. IH H-100 LOADER	3.5 HRS	----	INCL.	75.00	----	75.00	262.50
c. TEREX L-20 LOADER	2 HRS	----	INCL.	50.00	----	50.00	100.00
d. COMPACTED BACKFILL	144 C.Y.	5.00	----	----	----	5.00	720.00
e. PAVING SLOPES	173.4 S.Y.	15.00	----	----	----	15.00	2601.00
Sub-Total							\$4133.50
SCHEDULE 6 - GREEN COPPER MINE SITE							
a. TEREX L-20 LOADER	2 HRS	----	INCL.	50.00	----	50.00	\$ 100.00
b. FORD LT 9000 DUMP TRK	2.5 HRS	----	INCL.	50.00	----	50.00	125.00
c. SITE GRADING/CLEANUP	0.12 ACRE	2000.00	----	----	----	2000.00	240.00
Sub-Total							\$ 465.00
SCHEDULE 8 - HUMBOLDT SHAFT							
a. CASE 680C LDR/BACKHOE	3 HRS	----	INCL.	53.43	----	53.43	\$ 160.29
b. GALION T-500 GRADER	2 HRS	----	INCL.	61.57	----	61.57	123.14
c. COVER SOIL ROYALTY	200 C.Y.	2.00	----	----	----	2.00	400.00
d. ADD'L COVER SOIL	30 C.Y.	7.00	----	----	----	7.00	210.00
Sub-Total							\$ 893.43

COST OF CHANGES

DESCRIPTION	QUANTITY	MAT'LS	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	TOTAL COST
SCHEDULE 9 - ORPHAN BOY SHAFT							
a. GALION T-500 GRADER	4.5 HRS	----	INCL.	61.57	----	61.57	\$ 277.07
b. PROVIDE WATER	3350 GALS	0.04	----	INCL.	----	0.04	134.00
c. TREATED TIMBERS	5 EACH	16.09	----	----	----	16.09	<u>80.45</u>
Sub-Total							\$ 491.52
SCHEDULE 10 - DOWNEY SHAFT SITE							
a. HAUL/PLACE COVER SOIL	28 C.Y.	20.00	----	----	----	20.00	\$ 560.00
b. ADD'L COVER SOIL	30 C.Y.	7.00	----	----	----	7.00	<u>210.00</u>
Sub-Total							\$ 770.00
SCHEDULE 11 - MOOSE AURARIA MINE							
a. TEREX L. 20 LOADER	1 HR	----	INCL.	50.00	----	50.00	<u>\$ 50.00</u>
Sub-Total							\$ 50.00
SCHEDULE 15 - COLORADO SITE							
a. CASE 680C LOADER/BKHoe	3 HRS	----	INCL.	53.43	----	53.43	\$ 160.29
b. LABORERS	3 HRS	----	26.19	----	----	26.19	78.57
c. SEED	1 LB	20.00	----	----	----	20.00	20.00
d. FERTILIZER	9.5 LBS	2.00	----	----	----	2.00	19.00
e. MULCH	100 LBS	.20	----	----	----	0.20	<u>20.00</u>
Sub-Total							\$ 297.86
SCHEDULE 17 - CLEAR GRIT							
a. CASE 680C LOADER/BKHoe	4 HRS	----	INCL.	53.43	----	53.43	\$ 213.72
b. FORD LT 9000 DUMP TRK	1 HR	----	INCL.	50.00	----	50.00	50.00
c. IH H-100C LOADER	1 HR	----	INCL.	75.00	----	75.00	75.00
d. LABORER	8.5 HR	----	26.19	----	----	26.19	222.62
e. REMOVE/REPLACE PAVEMENT	78.5 S.Y.	15.00	INCL.	INCL.	----	15.00	1177.50
f. COVER SOIL	50 C.Y.	7.00	----	----	----	7.00	<u>350.00</u>
Sub-Total							\$2088.84
REVEGETATE MINNIE IRVINE MINE COVER SOIL PIT							
a. SEED	3 LBS	20.00	----	----	----	20.00	\$ 60.00
b. FERTILIZER	28.5 LBS	2.00	----	----	----	2.00	<u>57.00</u>
Sub-Total							\$ 117.00
EVALINE SHAFT CAP							
a. MOBILIZATION	1 LUMP SUM	----	----	----	1000.00	1000.00	\$1000.00
b. LOAD BEAMS	10 EACH	150.00	----	----	----	150.00	1500.00
c. HAUL BEAMS	4 LOADS	300.00	----	----	----	300.00	1200.00
d. FENCE REMOVAL	1 LUMP SUM	----	----	----	150.00	150.00	150.00
e. REMOVE COVER SOIL	45 C.Y.	5.00	----	----	----	5.00	225.00
f. GRAVEL PAD EXCAVATION	1 LUMP SUM	----	----	----	500.00	500.00	500.00
g. PLACE GRAVEL PAD	1 LUMP SUM	----	----	----	500.00	500.00	500.00
h. REMOVE TRASH	3 LOADS	150.00	----	----	----	150.00	450.00
i. SET BEAMS	10 EACH	400.00	----	----	----	400.00	4000.00
j. RELAY COVER SOIL	45 C.Y.	5.00	----	----	----	5.00	225.00
k. SITE GRADING	0.1 ACRE	5000.00	----	----	----	5000.00	500.00
l. GROUT PORT OPENING	1 LUMP SUM	200.00	----	----	----	200.00	<u>200.00</u>
Sub-Total							\$10450.00

RECONCILIATION OF FINAL QUANTITIES (SEE ATTACHED SHEETS)

-\$31,983.95

TOTAL CHANGE ORDER NO. 1 -\$ 8,688.42

RECONCILIATION OF FINAL QUANTITIES
BUTTE SHAFTS, PHASE 6

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	ACTUAL QUANTITY	TOTAL AMOUNT
SCHEDULE 1 - OTISCO SHAFT				
1.	EXCAVATION	2100.0 C.Y.	252.0 C.Y.	-\$ 3,696.00
4.	GRADING AND CLEANUP	0.75 ACRE	0.50 ACRE	- 250.00
5.	CRUSHED LIME VENEER	225.0 TONS	135.0 TONS	- 2,250.00
6.	PROVIDE COVER SOIL	1500.0 C.Y.	816.0 C.Y.	- 1,710.00
7.	MULCHING	2250.0 LBS.	1000.0 LBS.	- 250.00
8.	FERTILIZING	231.0 LBS.	95.2 LBS.	- 271.60
9.	SEEDING	15.0 LBS.	10.0 LBS.	- <u>100.00</u>
Sub-Total - SCHEDULE 1				-\$ 8,527.60
SCHEDULE 2 - OTISCO AIR SHAFT				
1.	BACKFILL SHAFT	170.0 C.Y.	322.0 C.Y.	+\$ 1,216.00
2.	PROVIDE WATER	10000.0 GALS.	30150.0 GALS	+ 806.00
4.	LIME	1.0 TON	0.0 TON	- 300.00
6.	FERTILIZER	15.0 LBS.	9.5 LBS.	- 22.00
7.	MULCH	150.0 LBS.	100.0 LBS.	- <u>25.00</u>
Sub-Total - SCHEDULE 2				+\$ 1,675.00
SCHEDULE 3 - BENHAM MINE SITE				
1.	BACKHOE	4.0 HRS.	4.75 HRS.	+\$ 56.25
2.	REMOVE & REPLACE PAVEMENT	128.0 S.Y.	150.3 S.Y.	+ 334.50
5.	COMPACTED BACKFILL	100.0 C.Y.	34.5 C.Y.	- 327.50
6.	REMOVE & REINSTALL BASKETBALL BACKBOARD & APPURTENANCES	1.0 L.S.	0.0 L.S.	- <u>200.00</u>
Sub-Total - SCHEDULE 3				-\$ 136.75

RECONCILIATION OF FINAL QUANTITIES (CONT'D)
BUTTE SHAFTS, PHASE 6

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	ACTUAL QUANTITY	TOTAL AMOUNT
SCHEDULE 4 - ANSELMO AIR SHAFT				
1.	REMOVE & DISPOSE OF EXISTING CONCRETE CAP	1.0 L.S.	0.0 L.S.	-\$ 1,500.00
5.	GRADING & CLEANUP	0.20 AC.	0.15 AC.	- 50.00
6.	LIMING	1.0 TON	0.0 TON	- 300.00
7.	MULCHING	600.0 LBS.	0.0 LBS.	- 150.00
8.	FERTILIZING	62.0 LBS.	0.0 LBS.	- 124.00
9.	SEEDING	4.0 LBS.	0.0 LBS.	- <u>80.00</u>
Sub-Total - SCHEDULE 4				-\$ 2,204.00
SCHEDULE 5 - WEST STEWART SITE				
1.	BACKHOE	4.0 HRS.	2.5 HRS.	-\$ 112.50
2.	BACKFILL SHAFT	100.0 C.Y.	109.5 C.Y.	+ 47.50
3.	PROVIDE WATER	10,000.0 GALS.	3350.0 GALS.	- <u>266.00</u>
Sub-Total - SCHEDULE 5				-\$ 331.00
SCHEDULE 6 - GREEN COPPER MINE SITE				
1.	BACKHOE	4.0 HRS.	3.0 HRS.	-\$ 75.00
2.	BACKFILL SHAFT	100.0 C.Y.	144.0 C.Y.	+ 220.00
3.	PROVIDE WATER	10,000.0 GALS	33,500.0 GALS	+ <u>940.00</u>
Sub-Total - SCHEDULE 6				+\$ 1,085.00
SCHEDULE 7 - HEANEY MINE SITE				
1.	BACKHOE	12.0 HRS.	0.0 HRS.	-\$ 900.00
2.	BACKFILL SHAFT	300.0 C.Y.	0.0 C.Y.	- 1,500.00

RECONCILIATION OF FINAL QUANTITIES (CONT'D)
BUTTE SHAFTS, PHASE 6

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	ACTUAL QUANTITY	TOTAL AMOUNT
3.	PROVIDE WATER	30,000.0 GALS.	0.0 GALS	- 1,200.00
4.	MOVE WASTE ROCK DUMP	4.0 HRS.	0.0 HRS.	- <u>400.00</u>
Sub-Total - SCHEDULE 7				-\$ 4,000.00
SCHEDULE 8 - HUMBOLDT SHAFT				
3.	GRADING & CLEANUP	0.10 ACRE	0.25 ACRE	+\$ 300.00
6.	MULCHING	300.0 LBS.	500.0 LBS.	+ 50.00
7.	FERTILIZER	30.0 LBS.	47.6 LBS.	+ 35.20
8.	SEEDING	2.0 LBS.	5.0 LBS.	+ <u>60.00</u>
Sub-Total - SCHEDULE 8				+\$ 445.20
SCHEDULE 9 - ORPHAN BOY SHAFT				
1.	REMOVE & REPLACE CHAIN LINK FENCE	50.0 L.F.	60.0 L.F.	+\$ 50.00
2.	REMOVE BELOW GRADE STRUCTURES			
	FOREMAN	12.0 HRS.	7.0 HRS.	- 175.00
	GENERAL LABOR	12.0 HRS.	6.5 HRS.	- 192.50
	D-8 CRAWLER TRACTOR	6.0 HRS.	0.0 HRS.	- 600.00
	BACKHOE	4.0 HRS.	5.0 HRS.	+ 75.00
	FRONT-END LOADER (6 C.Y.)	2.0 HRS.	8.5 HRS.	+ 487.50
	COMPRESSOR (100 CFM)	6.0 HRS.	1.0 HR.	- 150.00
	COMPACTOR	4.0 HRS.	3.5 HRS.	- 25.00
	GRAVEL BACKFILL	24.0 C.Y.	30.0 C.Y.	+ <u>120.00</u>
Sub-Total - SCHEDULE 9				-\$ 410.00
SCHEDULE 10 - DOWNEY SHAFT SITE				
2.	BACKFILL SHAFT	150.0 C.Y.	215.0 C.Y.	+\$ 325.00
3.	PROVIDE WATER	15000.0 GALS.	13400.0 GALS.	- 64.00
5.	LIMING	2.0 TONS	0.0 TON	- 600.00

RECONCILIATION OF FINAL QUANTITIES (CONT'D)
BUTTE SHAFTS, PHASE 6

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	ACTUAL QUANTITY	TOTAL AMOUNT
6.	MULCHING	300.0 LBS.	200.0 LBS.	- 25.00
7.	FERTILIZER	31.0 LBS.	19.0 LBS.	- <u>24.00</u>
Sub-Total - SCHEDULE 10				-\$ 388.00
SCHEDULE 11 - MOOSE AURARIA MINE SITE				
1.	BACKHOE	4.0 HRS.	2.0 HRS.	-\$ 150.00
2.	PROVIDE WATER	10000.0 GALS.	5025.0 GALS.	- 199.00
3.	BACKFILL SHAFT	100.0 C.Y.	157.5 C.Y.	+ <u>287.50</u>
Sub-Total - SCHEDULE 11				-\$ 61.50
SCHEDULE 12 - JOSEPHINE MINE SITE				
1.	BACKHOE	4.0 HRS.	2.25 HRS.	-\$ 131.25
2.	PROVIDE WATER	10000.0 GALS	3350.0 GALS.	- 266.00
3.	BACKFILL SHAFT	100.0 C.Y.	123.0 C.Y.	+ <u>115.00</u>
Sub-Total - SCHEDULE 12				-\$ 282.25
SCHEDULE 14 - SPRAY NOXIOUS WEEDS				
2.	BONANZA AIR	1.0 ACRE	2.8 ACRE	+\$ 720.00
3.	OPHIR	0.1 ACRE	0.4 ACRE	+ 180.00
4.	CLEAR GRIT	2.5 ACRE	7.2 ACRE	+ <u>1,880.00</u>
Sub-Total - SCHEDULE 14				+\$ 2,780.00
SCHEDULE 15 - COLORADO SITE				
1.	REMOVE & REPLACE EXISTING PRECAST CONCRETE CHANNELS	7.0 EACH	4.0 EACH	-\$ 1,500.00
2.	PRECAST CONCRETE CHANNELS	13.0 EACH	0.0 EACH	- 13,000.00

RECONCILIATION OF FINAL QUANTITIES (CONT'D)
BUTTE SHAFTS, PHASE 6

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	ACTUAL QUANTITY	TOTAL AMOUNT
3.	PRECAST CONCRETE BOX BEAM	120.0 L.F.	0.0 L.F.	- 9,600.00
4.	GRAVEL PADS	1.0 L.S.	0.2 L.S.	- 800.00
5.	GRADING & SITE CLEANUP	0.1 ACRE	0.05 ACRE	- 100.00
6.	UTILITY ADJUSTMENTS	1.0 L.S.	0.0 L.S.	- <u>300.00</u>
Sub-Total - SCHEDULE 15				-\$25,300.00
SCHEDULE 16 - WEST GAGNON				
1.	CURB REPAIR	1.0 L.F.	2.5 L.F.	+\$ 75.00
4.	MULCHING	150.0 LBS.	100.0 LBS.	- 10.00
5.	FERTILIZING	15.0 LBS.	9.5 LBS.	- <u>11.00</u>
Sub-Total - SCHEDULE 16				+\$ 54.00
SCHEDULE 17 - CLEAR GRIT				
1.	BACKHOE	4.0 HRS.	1.25 HRS.	-\$ 206.25
2.	BACKFILL SHAFT	100.0 C.Y.	147.0 C.Y.	+ 235.00
3.	PROVIDE WATER	10000.0 GALS.	53600.0 GALS.	+ 1,744.00
4.	RIPRAP CHANNEL IMPROVEMENTS	175.0 L.F.	180.0 L.F.	+ 25.00
5.	CULVERT - 18" DIAMETER RCP	84.0 L.F.	90.0 L.F.	+ 240.00
6.	CONSTRUCT ROADWAY BORROW DITCH	300.0 L.F.	321.0 L.F.	+ 105.00
7.	EXCAVATION	100.0 C.Y.	168.0 C.Y.	+ 340.00
8.	SITE GRADING & CLEANUP	0.20 ACRE	0.50 ACRE	+ 600.00
9.	LIMING	1.0 TON	0.0 TON	- 300.00
11.	FERTILIZING	62.0 LBS.	57.1 LBS.	- 9.80
12.	SEEDING	4.0 LBS.	6.0 LBS.	+ <u>40.00</u>
Sub-Total - SCHEDULE 17				+\$ 2,812.95

RECONCILIATION OF FINAL QUANTITIES (CONT'D)
BUTTE SHAFTS, PHASE 6

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	ACTUAL QUANTITY	TOTAL AMOUNT
SCHEDULE 18 - DIAMOND				
1.	SITE GRADING	1.0 ACRE	1.38 ACRE	+\$ 380.00
2.	INTERCEPTOR DITCH	200.0 L.F.	285.0 L.F.	+ <u>425.00</u>
	Sub-Total - SCHEDULE 18			+\$ 805.00
TOTAL - SCHEDULES 1 THROUGH 18				<u><u>-\$31,983.95</u></u>

ATTACHMENT 3

FINAL PAY REQUEST

PAYMENT REQUEST NO. 1 (FINAL)

FROM July 23, 1990 TO October 30, 1990

PROJECT TITLE: BUTTE SHAFTS RECLAMATION PROJECT, PHASE VI

LOCATION: Silver Bow County, MT MONT A/E or DSL-AMRB: 90-007

NAME OF CONTRACTOR: SKINNER ENTERPRISES

ADDRESS: PO Box 5447 Helena, MT 59604

SUMMARY OF PROJECT STATUS

Amount of Original Contract \$ 163,107.00

Change Order No. 1 - \$ 8,688.42

Change Order No. \$

Change Order No. \$

Amount of Approved Change Order(s) \$ - 8,688.42

TOTAL CONTRACT AMOUNT \$ 154,418.58

Pay Request No.	Amount of Request

Total Contract Amount Completed to Date \$ 154,418.58

Less Retainage (%) \$ 0.00

TOTAL AMOUNT EARNED TO DATE \$ 154,418.58

Less Previous Payments \$ 0.00

AMOUNT DUE THIS PAYMENT \$ 154,418.58

Less 1% Tax \$ 1,544.19

TOTAL DUE CONTRACTOR \$ 152,874.39

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

APPROVED BY:

SKINNER ENTERPRISES
Contractor

DSL-AMRB
Owner

By [Signature]

Date 11-21-90

By [Signature]

Date 12/6/90

RECOMMENDED BY:

L.C. HANSON CO.
Engineer

By [Signature]

Date 11/27/90

RECEIVED
DEC 11 1990
L. C. HANSON CO.

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	ALL SITES							
1	Mobilization	1.00	L.S.	10000.00	1.0	1.0	10000.00	100%*
2	Temporary Surface Bulk-							
	head	1.00	L.S.	5000.00	1.0	1.0	5000.00	100%*
	SCHEDULE 1							
	Otisco Shaft							
1	Excavation	2100.00	C.Y.	2.00	252.0	252.0	504.00	100%*
2	Gravel Pads	1.00	L.S.	500.00	1.0	1.0	500.00	100%*
3	Precast Concrete Channel							
	Sections - 27'	10.00	EACH	1000.00	10.0	10.0	10000.00	100%*
4	Grading & Cleanup	0.75	ACRE	1000.00	0.5	0.5	500.00	100%*
5	Cr. Limestone Veneer	225.00	TONS	25.00	135.0	135.0	3375.00	100%*
6	Provide Cover Soil	1500.00	C.Y.	2.50	816.0	816.0	2040.00	100%*
7	Mulching	2250.00	LBS.	0.20	1000.0	1000.0	200.00	100%*
8	Fertilizing	231.00	LBS.	2.00	95.2	95.2	190.40	100%*
9	Seeding	15.00	LBS.	20.00	10.0	10.0	200.00	100%*
	Total - Schedule 1						17509.40	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	SCHEDULE 2							
	Otisco Air Shaft							
1	Backfill Shaft	170.00	C.Y.	8.00	322.0	322.0	2576.00	100%*
2	Provide Water	10000.00	GALS	0.04	30150.0	30150.0	1206.00	100%*
3	Grading & Cleanup	0.05	ACRE	6000.00	0.1	0.1	300.00	100%*
4	Lime	1.00	TON	300.00	0.0	0.0	0.00	100%*
5	Seed	1.00	LBS.	100.00	1.0	1.0	100.00	100%*
6	Fertilizer	15.00	LBS.	4.00	9.5	9.5	38.00	100%*
7	Mulch	150.00	LBS.	0.50	100.0	100.0	50.00	100%*
	Total - Schedule 2						4270.00	
	SCHEDULE 3							
	Benham Mine Site							
1	Backhoe	4.00	HRS.	75.00	4.8	4.8	356.25	100%*
2	Remove & Replace Pavement	128.00	S.Y.	15.00	150.3	150.3	2254.50	100%*
3	Gravel Pads	1.00	L.S.	500.00	1.0	1.0	500.00	100%*
	Subtotal						3110.75	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
4	Precast Concrete Channel							
	Sections - 27'	10.00	EACH	1000.00	10.0	10.0	10000.00	100%*
5	Compacted Backfill	100.00	C.Y.	5.00	34.5	34.5	172.50	100%*
6	Remove & Reinstall Basket							
	ball Backboard & Appur-							
	tenances	1.00	L.S.	200.00	0.0	0.0	0.00	100%*
	Total - Schedule 3						13283.25	
	SCHEDULE 4							
	Anselmo Air Shaft							
1	Remove & Dispose of Exist							
	ing Concrete Cap	1.00	L.S.	1500.00	0.0	0.0	0.00	100%*
2	Gravel Pads	1.00	L.S.	500.00	1.0	1.0	500.00	100%*
3	Precast Concrete Channel							
	Sections - 27'	10.00	EACH	1000.00	10.0	10.0	10000.00	100%*
4	Weld Steel Door	1.00	L.S.	100.00	1.0	1.0	100.00	100%*
5	Grading & Cleanup	0.20	ACRE	1000.00	0.2	0.2	150.00	100%*
	Subtotal						10750.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
6	Liming	1.00	TON	300.00	0.0	0.0	0.00	100%*
7	Mulching	600.00	LBS.	0.25	0.0	0.0	0.00	100%*
8	Fertilizing	62.00	LBS.	2.00	0.0	0.0	0.00	100%*
9	Seeding	4.00	LBS.	20.00	0.0	0.0	0.00	100%*
	Total - Schedule 4						10750.00	
	SCHEDULE 5							
	West Stewart Site							
1	Backhoe	4.00	HRS.	75.00	2.5	2.5	187.50	100%*
2	Backfill Shaft	100.00	C.Y.	5.00	109.5	109.5	547.50	100%*
3	Provide Water	10000.00	GALS	0.04	3350.0	3350.0	134.00	100%*
	Total - Schedule 5						869.00	
	SCHEDULE 6							
	Green Copper Mine Site							
1	Backhoe	4.00	HRS.	75.00	3.0	3.0	225.00	100%*
2	Backfill Shaft	100.00	C.Y.	5.00	144.0	144.0	720.00	100%*
	Subtotal						945.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
3	Provide Water	10000.00	GALS	0.04	33500.0	33500.0	1340.00	100%*
	Total - Schedule 6						2285.00	
	SCHEDULE 7							
	Heaney Mine Site							
1	Backhoe	12.00	HRS.	75.00	0.0	0.0	0.00	100%*
2	Backfill Shaft	300.00	C.Y.	5.00	0.0	0.0	0.00	100%*
3	Provide Water	30000.00	GALS	0.04	0.0	0.0	0.00	100%*
4	Move Waste Rock Dump	4.00	HRS.	100.00	0.0	0.0	0.00	100%*
	Total - Schedule 7						0.00	
	SCHEDULE 8							
	Humboldt Shaft							
1	Gravel Pads	1.00	L.S.	1500.00	1.0	1.0	1500.00	100%*
2	Precast Concrete Channel							
	Sections - 27'	10.00	EACH	1000.00	10.0	10.0	10000.00	100%*
3	Grading & Cleanup	0.10	ACRE	2000.00	0.3	0.3	500.00	100%*
	Subtotal						12000.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007			Page 7 of 22	
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
4	Cr. Limestone Veneer	30.00	TONS	25.00	30.0	30.0	750.00	100%*
5	Provide Cover Soil	200.00	C.Y.	5.00	200.0	200.0	1000.00	100%*
6	Mulching	300.00	LBS.	0.25	500.0	500.0	125.00	100%*
7	Fertilizer	30.00	LBS.	2.00	47.6	47.6	95.20	100%*
8	Seeding	2.00	LBS.	20.00	5.0	5.0	100.00	100%*
	Total - Schedule 8						14070.20	
	SCHEDULE 9							
	Orphan Boy Shaft							
1	Remove & Replace Chain							
	Link Fence	50.00	L.F.	5.00	60.0	60.0	300.00	100%*
2	Remove Below Grade Structures:							
	Foreman	12.00	HRS.	35.00	7.0	7.0	245.00	100%*
	General Labor	12.00	HRS.	35.00	6.5	6.5	227.50	100%*
	D-8 Crawler Tractor	6.00	HRS.	100.00	0.0	0.0	0.00	100%*
	Backhoe	4.00	HRS.	75.00	5.0	5.0	375.00	100%*
	Subtotal						1147.50	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	Front-End Loader(6 CY)	2.00	HRS.	75.00	8.5	8.5	637.50	100%*
	Compressor (100 CFM)	6.00	HRS.	30.00	1.0	1.0	30.00	100%*
	Compactor	4.00	HRS.	50.00	3.5	3.5	175.00	100%*
	Gravel Backfill	24.00	C.Y.	20.00	30.0	30.0	600.00	100%*
3	Precast Concrete Channel Sections							
	a. 19' Long	10.00	EACH	800.00	10.0	10.0	8000.00	100%*
	b. 27' Long	10.00	EACH	1000.00	10.0	10.0	10000.00	100%*
4	Gravel Pads	1.00	L.S.	1000.00	1.0	1.0	1000.00	100%*
5	Prestressed Concrete Box Beam	45.00	L.F.	100.00	45.0	45.0	4500.00	100%*
6	Grading & Cleanup	0.25	ACRE	1000.00	0.3	0.3	250.00	100%*
	Total - Schedule 9						26340.00	
	SCHEDULE 10							
	Downey Shaft Site							
1	Backhoe	4.00	HRS.	75.00	4.0	4.0	300.00	100%*
	Subtotal						300.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007			Page 9 of 22	
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
2	Backfill Shaft	150.00	C.Y.	5.00	215.0	215.0	1075.00	100%*
3	Provide Water	15000.00	GALS	0.04	13400.0	13400.0	536.00	100%*
4	Grading & Cleanup	0.10	ACRE	2000.00	0.1	0.1	200.00	100%*
5	Liming	2.00	TON	300.00	0.0	0.0	0.00	100%*
6	Mulching	300.00	LBS.	0.25	200.0	200.0	50.00	100%*
7	Fertilizer	31.00	LBS.	2.00	19.0	19.0	38.00	100%*
8	Seeding	2.00	LBS.	20.00	2.0	2.0	40.00	100%*
	Total - Schedule 10						2239.00	
	SCHEDULE 11							
	Moose Auraria Mine Site							
1	Backhoe	4.00	HRS.	75.00	2.0	2.0	150.00	100%*
2	Provide Water	10000.00	GALS	0.04	5025.0	5025.0	201.00	100%*
3	Backfill Shaft	100.00	C.Y.	5.00	157.5	157.5	787.50	100%*
	Total - Schedule 11						1138.50	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	SCHEDULE 12							
	Josephine Mine Site							
1	Backhoe	4.00	HRS.	75.00	2.3	2.3	168.75	100%*
2	Provide Water	10000.00	GALS	0.04	3350.0	3350.0	134.00	100%*
3	Backfill Shaft	100.00	C.Y.	5.00	123.0	123.0	615.00	100%*
	Total - Schedule 12						917.75	
	SCHEDULE 13							
	Grout Lifting Ring Pock-							
	ets (6 Sites)							
1	Original	1.00	L.S.	200.00	1.0	1.0	200.00	100%*
2	Emma	1.00	L.S.	200.00	1.0	1.0	200.00	100%*
3	Mary Louise No. 2	1.00	L.S.	200.00	1.0	1.0	200.00	100%*
4	Bonanza Air	1.00	L.S.	200.00	1.0	1.0	200.00	100%*
5	Ophir	1.00	L.S.	200.00	1.0	1.0	200.00	100%*
6	Diamond	1.00	L.S.	200.00	1.0	1.0	200.00	100%*
	Total - Schedule 13						1200.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	SCHEDULE 14							
	Spray Noxious Weeds							
1	Mary Louise No. 2	0.20	ACRE	600.00	0.2	0.2	120.00	100%*
2	Bonanza Air	1.00	ACRE	400.00	2.8	2.8	1120.00	100%*
3	Ophir	0.10	ACRE	600.00	0.4	0.4	240.00	100%*
4	Clear Grit	2.50	ACRE	400.00	7.2	7.2	2880.00	100%*
	Total - Schedule 14						4360.00	
	SCHEDULE 15							
	Colorado Site							
1	Remove & Replace Existing							
	Precast Concrete Channels	7.00	EACH	500.00	4.0	4.0	2000.00	100%*
2	Precast Concrete Channels	13.00	EACH	1000.00	0.0	0.0	0.00	100%*
3	Prestressed Concrete Box							
	Beam	120.00	L.F.	80.00	0.0	0.0	0.00	100%*
4	Gravel Pads	1.00	L.S.	1000.00	0.2	0.2	200.00	100%*
5	Grading & Site Cleanup	0.10	ACRE	2000.00	0.1	0.1	100.00	100%*
	Subtotal						2300.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007			Page 12 of 22	
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
6	Utility Adjustments	1.00	L.S.	300.00	0.0	0.0	0.00	100%*
	Total - Schedule 15						2300.00	
	SCHEDULE 16							
	West Gagnon							
1	Curb Repair	1.00	L.F.	50.00	2.5	2.5	125.00	100%*
2	Site Grading	0.05	ACRE	2000.00	0.1	0.1	100.00	100%*
3	Provide Cover Soil	10.00	C.Y.	20.00	10.0	10.0	200.00	100%*
4	Mulching	150.00	LBS.	0.20	100.0	100.0	20.00	100%*
5	Fertilizing	15.00	LBS.	2.00	9.5	9.5	19.00	100%*
6	Seeding	1.00	LBS.	20.00	1.0	1.0	20.00	100%*
	Total - Schedule 16						484.00	
	SCHEDULE 17							
	Clear Grit							
1	Backhoe	4.00	HRS.	75.00	1.3	1.3	93.75	100%*
2	Backfill Shaft	100.00	C.Y.	5.00	147.0	147.0	735.00	100%*
	Subtotal						828.75	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007			Page 13 of 22	
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
3	Provide Water	10000.00	GALS	0.04	53600.0	53600.0	2144.00	100%*
4	Riprap Channel Improve-							
	ments	175.00	L.F.	5.00	180.0	180.0	900.00	100%*
5	Culvert - 18" Dia. RCP	84.00	L.F.	40.00	90.0	90.0	3600.00	100%*
6	Construct Roadway Borrow							
	Ditch	300.00	L.F.	5.00	321.0	321.0	1605.00	100%*
7	Excavation	100.00	C.Y.	5.00	168.0	168.0	840.00	100%*
8	Site Grading & Cleanup	0.20	ACRE	2000.00	0.5	0.5	1000.00	100%*
9	Liming	1.00	TONS	300.00	0.0	0.0	0.00	100%*
10	Mulching	600.00	LBS.	0.25	600.0	600.0	150.00	100%*
11	Fertilizing	62.00	LBS.	2.00	57.1	57.1	114.20	100%*
12	Seeding	4.00	LBS.	20.00	6.0	6.0	120.00	100%*
	Total - Schedule 17						11301.95	
	SCHEDULE 18							
	Diamond							
1	Site Grading	1.00	ACRE	1000.00	1.4	1.4	1380.00	100%*
	Subtotal						1380.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
2	Interceptor Ditch	200.00	L.F.	5.00	285.0	285.0	1425.00	100%*
	Total - Schedule 18						2805.00	
	TOTAL Schedules 1-18						131123.05	
	CHANGE ORDER NO.1							
	Work Direct. Chg. No.1							
	Britania Shaft 8/15-8/17							
	a.TEREX L-20 Loader	5.00	HRS.	50.00	5.0	5.0	250.00	100%*
	b.Provide Water	5000.00	GALS	0.04	5000.0	5000.0	200.00	100%*
	c.Laborers	7.50	HRS.	26.19	7.5	7.5	196.43	100%*
	d.Metal Fence Posts	10.00	EACH	2.58	10.0	10.0	25.80	100%*
	e.Fence Materials	2.00	ROLL	32.20	2.0	2.0	64.40	100%*
	Subtotal						736.63	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007		Page 15 of 22		
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	Work Direct. Chg. No.2							
	55 E.Center St. 9/10-9/11							
	a.CASE 680C Loader/Bkhoe	6.00	HRS.	55.00	6.0	6.0	330.00	100%*
	b.Laborers	32.75	HRS.	26.19	32.8	32.8	857.72	100%*
	c.Burlap	1.00	L.S.	46.75	1.0	1.0	46.75	100%*
	Subtotal						1234.47	
	Supplemental Work for							
	Schedules 1-18							
	SCH.1-Otisco Shaft							
	1.Equip.Rental							
	a.TEREX L-20 Loader	6.00	HRS.	50.00	6.0	6.0	300.00	100%*
	b.GALION T-500 Grader	4.00	HRS.	61.57	4.0	4.0	246.28	100%*
	2.Provide Water	10050.00	GALS	0.04	10050.0	10050.0	402.00	100%*
	Total						948.28	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	SCH.2-Otisco Air Shaft							
	1.Cover Soil	30.0	C.Y.	7.00	30.0	30.0	210.00	100%*
	Total						210.00	
	SCH.3-Benham Mine Site							
	1.Equip.Rental							
	a.FORD LT 9000 Dump Trk	2.5	HRS.	50.00	2.5	2.5	125.00	100%*
	b.TEREX L-20 Loader	3.0	HRS.	50.00	3.0	3.0	150.00	100%*
	2.Provide Water	3350.0	GALS	0.04	3350.0	3350.0	134.00	100%*
	Total						409.00	
	SCH.4-Anselmo Air Shaft							
	1.Equip.Rental							
	a.FORD LT 9000 Dump Trk	9.0	HRS.	50.00	9.0	9.0	450.00	100%*
	b.IH H-100 Loader	3.5	HRS.	75.00	3.5	3.5	262.50	100%*
	c.TEREX L-20 Loader	2.0	HRS.	50.00	2.0	2.0	100.00	100%*
	2.Compacted Backfill	144.0	C.Y.	5.00	144.0	144.0	720.00	100%*
	Subtotal						1532.50	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	3.Paving Slopes	173.4	S.Y.	15.00	173.4	173.4	2601.00	100%*
	Total						4133.50	
	SCH.6-Gr.Copper Mine Site							
	1.Equip.Rental							
	a.TEREX L-20 Loader	2.0	HRS.	50.00	2.0	2.0	100.00	100%*
	b.FORD LT 9000 Dump Trk	2.5	HRS.	50.00	2.5	2.5	125.00	100%*
	2.Site Grading & Cleanup	0.1	ACRE	2000.00	0.1	0.1	240.00	100%*
	Total						465.00	
	SCH.8-Humboldt Shaft							
	1.Equip.Rental							
	a.CASE 680C Ldr/Backhoe	3.0	HRS.	53.43	3.0	3.0	160.29	100%*
	b.GALION T-500 Grader	2.0	HRS.	61.57	2.0	2.0	123.14	100%*
	2.Cover Soil Royalty	200.0	C.Y.	2.00	200.0	200.0	400.00	100%*
	3.Add'l. Cover Soil	30.0	C.Y.	7.00	30.0	30.0	210.00	100%*
	Total						893.43	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007		Page 18 of 22		
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	SCH.9-Orphan Boy Shaft							
	1.Equip.Rental							
	a.GALION T-500 Grader	4.5	HRS.	61.57	4.5	4.5	277.07	100%*
	2.Provide Water	3350.0	GALS	0.04	3350.0	3350.0	134.00	100%*
	3.Materials							
	a.Treated Timbers	5.0	EACH	16.09	1.0	5.0	80.45	100%*
	Total						491.52	
	SCH.10-Downey Shaft Site							
	1.Haul & Place Cover Soil	28.0	C.Y.	20.00	28.0	28.0	560.00	100%*
	2.Add'l. Cover Soil	30.0	C.Y.	7.00	30.0	30.0	210.00	100%*
	Total						770.00	
	SCH.11-Moose Auraria Mine							
	1.Equip.Rental							
	a.TEREX L-20 Loader	1.0	HRS.	50.00	1.0	1.0	50.00	100%*
	Total						50.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007		Page 19 of 22		
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	SCH.15-Colorado Site							
	1.Equip.Rental							
	a.CASE 680C Ldr/Backhoe	3.0	HRS.	53.43	3.0	3.0	160.29	100%*
	b.Laborers	3.0	HRS.	26.19	3.0	3.0	78.57	100%*
	2.Seed	1.0	LBS.	20.00	1.0	1.0	20.00	100%*
	3.Fertilizer	9.5	LBS.	2.00	9.5	9.5	19.00	100%*
	4.Mulch	100.0	LBS.	0.20	100.0	100.0	20.00	100%*
	Total						297.86	
	SCH.17-Clear Grit							
	1.Equip.Rental							
	a.CASE 680C Ldr/Backhoe	4.0	HRS.	53.43	4.0	4.0	213.72	100%*
	b.FORD LT 9000 Dump Trk	1.0	HRS.	50.00	1.0	1.0	50.00	100%*
	c.IH H-100C Loader	1.0	HRS.	75.00	1.0	1.0	75.00	100%*
	d.Laborer	8.5	HRS.	26.19	8.5	8.5	222.62	100%*
	2.Remove & Replace Pavement	78.5	S.Y.	15.00	78.5	78.5	1177.50	100%*
	Subtotal						1738.84	

* Work completed on this item

L.C.Hanson Co.

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI

MONT. AMRB 90-007

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ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	EVALINE SHAFT CAP							
1	Transport Existing Conc. Channels							
	a.Mobilization	1.0	L.S.	1000.00	1.0	1.0	1000.00	100%*
	b.Load Beams	10.0	EACH	150.00	10.0	10.0	1500.00	100%*
	c.Haul Beams	4.0	LOAD	300.00	4.0	4.0	1200.00	100%*
2	Excavate & Construct Gravel Pads							
	a.Fence Removal	1.0	L.S.	150.00	1.0	1.0	150.00	100%*
	b.Remove Cover Soil	100.0	C.Y.	5.00	45.0	45.0	225.00	100%*
	c.Gravel Pad Excavation	1.0	L.S.	500.00	1.0	1.0	500.00	100%*
	d.Place Gravel Pad	1.0	L.S.	500.00	1.0	1.0	500.00	100%*
	e.Remove Trash	2.0	LOAD	150.00	3.0	3.0	450.00	100%*
3	Place Conc. Channels							
	a.Set Beams	10.0	EACH	400.00	10.0	10.0	4000.00	100%*
	Subtotal						9525.00	

* Work completed on this item

PAY REQUEST NO.1 (FINAL)

L.C.Hanson Co.

PROJECT: BUTTE SHAFTS PROJECT - PHASE VI				MONT. AMRB 90-007		Page 22 of 22		
ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITIES		UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMPL.
	EVALINE SHAFT CAP (Con't)							
4	Site Grading & Cleanup							
	a.Relay Cover Soil	100.0	C.Y.	5.00	45.0	45.0	225.00	100%*
	b.Site Grading	0.1	ACRE	5000.00	0.1	0.1	500.00	100%*
5	Liming,Mulching,Fertiliz-							
	ing,and Seeding							
	a.Liming	2.0	TONS	300.00	0.0	0.0	0.00	100%*
	b.Mulching	300.0	LBS.	1.00	0.0	0.0	0.00	100%*
	c.Fertilizer	31.0	LBS.	5.00	0.0	0.0	0.00	100%*
	d.Seed	2.0	LBS.	40.00	0.0	0.0	0.00	100%*
6	Grout Port Opening	1.0	L.S.	200.00	1.0	1.0	200.00	100%*
	Total						10450.00	
	TOTAL Change Order No.1						23295.53	

* Work completed on this item

ATTACHMENT 4

ANALYSIS OF CONSULTANT COSTS INCURRED

ANALYSIS OF CONSULTANT COSTS INCURRED
 FOR THE MONTANA DEPARTMENT OF STATE LANDS
 ABANDONED MINE RECLAMATION BUREAU
 AMR PROJECT NUMBER: MONTANA A/E 90-007
 BUTTE SHAFTS VI
 LCH PROJECT NUMBER: 901005
 DATE OF PREPARATION: December 28, 1990

ENGINEERING SERVICE

AMOUNT

DESIGN ENGINEERING:

This work was done by others.

CONSTRUCTION ENGINEERING AND
 PROJECT ADMINISTRATION COST:

L. C. Hanson Company

\$37,803.37

PROJECT ENGINEERING COST:

\$37,803.37

CONSTRUCTION COST:

\$154,418.58

TO CALCULATE PERCENTAGE ENGINEERING FEES TO CONSTRUCTION COST:

DESIGN ENGINEERING/CONSTRUCTION COST

*

CONSTRUCTION ENGINEERING/CONSTRUCTION COST

24.4811%

TOTAL ENGINEERING COST/CONSTRUCTION COST

*

ATTACHMENT 5

AS-BUILT DRAWINGS

NOTE: PLAN SHEETS WERE NOT REDUCED TO THE REQUIRED 11"x17" SIZE FOR THIS PROJECT. AS-BUILTS ARE PRESENTED ON THE STANDARD 24"x36" SIZED DRAWINGS AND INCLUDED UNDER SEPARATE COVER WITH THIS FINAL REPORT.

ATTACHMENT 6

PHOTOS/SLIDES

PHOTOGRAPHS/SLIDES

8/15/90	Moose Auraria - View north.
8/15/90	Moose Auraria - View east @ excavation.
8/15/90	Moose Auraria - Water truck.
8/15/90	Moose Auraria - Emergency/Decon Truck.
8/15/90	Britania - Open shafts.
8/15/90	Britania - Open shafts.
8/15/90	Britania - Open shafts.
8/15/90	Britania - Open shafts.
8/15/90	Britania - Open shafts.
8/15/90	Moose Auraria - View of excavated shaft.
8/15/90	Moose Auraria - Water flooding.
8/15/90	Moose Auraria - Water draining in hole.
8/15/90	Moose Auraria - Terex L-20 Loader.
8/15/90	Britania - Placing fence.
8/15/90	Britania - Andy tying off.
8/15/90	Britania - Removing.
8/16/90	Britania - Removing timber cover.
8/16/90	Britania - Completed fencing - view west.
8/16/90	Britania - Fencing - view east.
8/16/90	Britania - Area around small open hole.
8/16/90	Britania - Small hole view northeast.
8/16/90	Josephine Stope - View west (excavation).
8/16/90	Josephine Stope - View west (excavation).
8/16/90	Josephine Stope - Ponded water.
8/16/90	Josephine Stope - Shaft finish backfill.

PHOTOGRAPHS/SLIDES (cont'd)

8/16/90	Josephine - Post construction.
8/16/90	West Steward - Preconstruction.
8/16/90	West Steward - Preconstruction.
8/17/90	West Steward - Haulway tunnel and excavation.
8/17/90	West Steward - Haulway tunnel and excavation.
8/17/90	West Steward - Loader and backfill.
8/17/90	West Steward - Backfilled gallery.
8/17/90	West Steward - Backfill w/Excavator.
8/17/90	West Steward - Equipment moving to next site.
8/17/90	Downey - Preconstruction - view of Discovery.
8/17/90	Downey - Preconstruction - view of Discovery.
8/17/90	Downey - Preconstruction - view northwest.
8/17/90	Downey - View at subsidence.
8/17/90	Downey - View of excavation within hole.
8/17/90	Downey - View down 20' into hole.
8/17/90	Downey - View down 20' into hole.
8/21/90	Downey - View west @ Downey.
8/21/90	Downey - View down shaft.
8/21/90	Downey - Overall view southeast.
8/21/90	Downey - Opened shaft.
8/21/90	Downey - Water in shaft.
8/21/90	Downey - View of Discovery Shaft.
8/21/90	Downey - Backfilling.

PHOTOGRAPHS/SLIDES (cont'd)

8/21/90	Clear Grit - Preconstruction of shaft.
8/21/90	Clear Grit - Preconstruction of shaft.
8/21/90	Clear Grit - Utility adjustment.
8/21/90	Clear Grit - Overall of excavation.
8/21/90	Clear Grit - View down shaft.
8/21/90	Clear Grit - View down shaft.
8/21/90	Clear Grit - View of water flooding.
8/21/90	Clear Grit - View of water flooding.
8/21/90	Clear Grit - View of water draining.
8/21/90	Clear Grit - Temporary bulkhead placement.
8/21/90	Clear Grit - Temporary bulkhead placement.
8/21/90	Clear Grit - Preconstruction view of ditch.
8/21/90	Clear Grit - View of plugged drain.
8/22/90	Clear Grit - Preconstruction area - photo of ditch.
8/22/90	Clear Grit - Preconstruction area.
8/22/90	Clear Grit - Preconstruction area.
8/22/90	Clear Grit - Preconstruction area.
8/22/90	Clear Grit - View east @ ditch work.
8/22/90	Green Mountain - View of ponding.
8/22/90	Clear Grit - Ditch work.
8/22/90	Clear Grit - Ditch work.
8/22/90	Clear Grit - Ditch work.
8/22/90	Clear Grit - Ditch work.

PHOTOGRAPHS/SLIDES (cont'd)

[illegible]

PHOTOGRAPHS/SLIDES (cont'd)

8/24/90	Otisco Shaft - Preconstruction - view northeast.
8/24/90	Otisco Shaft - Preconstruction - view north.
8/24/90	Otisco Shaft - Preconstruction - view east.
8/24/90	Otisco Shaft - Preconstruction - view east.
8/24/90	Otisco Shaft - Preconstruction - view east.
8/24/90	Otisco Shaft - Preconstruction - view southeast.
8/24/90	Otisco Air - View northwest at rains.
8/24/90	Otisco Air - View west.
8/24/90	Otisco Air - View of backfill.
8/27/90	29 W. LaPlatta - View north at reported hole.
8/27/90	29 W. LaPlatta - View east at reported hole.
8/27/90	Otisco Air - Debris removal.
8/27/90	Otisco Air - Flooding shaft.
8/27/90	Green Copper - Timber excavation and cover soil salvage.
8/27/90	Green Copper - Stockpiled cover soil.
8/27/90	Green Copper - View down shaft.
8/27/90	Green Copper - Water flooding.
8/27/90	Green Copper - Water drained.
8/27/90	Green Copper - Continued flooding.
8/27/90	Green Copper - Continued flooding.
8/27/90	Green Copper - View east at site.
8/27/90	Green Copper - View of plugged shaft.
8/27/90	Green Copper - View west at site.
8/27/90	Green Copper - View at temporary bulkhead.

PHOTOGRAPHS/SLIDES (cont'd)

8/28/90	Green Copper - View down excavated hole.
8/28/90	Green Copper - Shaft with backfill.
8/28/90	Green Copper - Imported backfill.
8/28/90	Green Copper - Compacted shaft.
8/28/90	Green Copper - Compacted shaft backfill.
8/28/90	Green Copper - Loading equipment.
8/28/90	Green Copper - Limestone veneer.
8/28/90	Green Copper - Limestone veneer.
8/29/90	Green Copper - Limestone veneer.
8/29/90	Green Copper - Limestone veneer.
8/29/90	Clear Grit - View west of pipe location.
8/29/90	Clear Grit - View south of pipe location.
8/29/90	Clear Grit - View of pipe markings.
8/29/90	Clear Grit - View of pavement cutting.
8/29/90	Clear Grit - View of pavement condition.
8/29/90	Clear Grit - View north at ditch problem.
8/29/90	Clear Grit - View northeast at ditch break.
8/29/90	Clear Grit - View north at loader/pavement removal.
8/29/90	Clear Grit - Overview of grader.
8/30/90	Clear Grit - View east at pipe excavation.
8/30/90	Clear Grit - Manhole exposure.
8/30/90	Clear Grit - RCP placement - view east.
8/30/90	Clear Grit - Closeup of rubber gasket.

PHOTOGRAPHS/SLIDES (cont'd)

[illegible]

PHOTOGRAPHS/SLIDES (cont'd)

9/10/90	Center Street - View northeast at Group.
9/10/90	Center Street - View of pipe repair.
9/10/90	Center Street - View northeast at cement truck.
9/12/90	Humboldt - View east across north footing.
9/12/90	Humboldt - View east across south footing.
9/12/90	Humboldt - View east at pipe staking and centerline shaft with I.D. at center of shaft.
9/12/90	Humboldt - View north at general area.
9/12/90	Humboldt - View of pad preparation.
9/13/90	Humboldt - View of gravel pad work.
9/13/90	Humboldt - Power line shielding.
9/13/90	Humboldt - View west at 3 panels.
9/13/90	Humboldt - View north at panels.
9/13/90	Humboldt - View east at crane.
9/13/90	Humboldt - View southeast at crane/semi.
9/14/90	Humboldt - View south at panel work.
9/14/90	Humboldt - View south at last panel.
9/14/90	Humboldt - View of all panels in place.
9/17/90	Otisco Shaft - View of grader on slope.
9/17/90	Otisco Shaft - View of grader on slope.
9/17/90	Otisco Shaft - View south at general area.
9/17/90	Otisco Shaft - View south at general area.
9/17/90	Otisco Shaft - View south at grading.
9/18/90	Otisco Shaft - Gravel pad work.
9/18/90	Otisco Shaft - Gravel pad work.

PHOTOGRAPHS/SLIDES (cont'd)

9/18/90	Otisco Shaft - View north at channels.
9/18/90	Otisco Shaft - View east at gravel pads.
9/18/90	Otisco Shaft - View west at channels.
9/18/90	Benham - View east - preconstruction.
9/18/90	Benham - View north - preconstruction.
9/18/90	Benham - View west - preconstruction.
9/18/90	Benham - Pavement removal.
9/18/90	Benham - Pavement removal.
9/18/90	Benham - Secured site/end day.
9/19/90	Benham - View of timbers.
9/19/90	Benham - View of timbers.
9/19/90	Benham - Shaft excavation.
9/19/90	Benham - View east at site work.
9/19/90	Benham - View south at loader.
9/20/90	Benham - Completed gravel pads.
9/20/90	Benham - Completed gravel pads.
9/20/90	Benham - View east at prepared pads.
9/20/90	Benham - View of panel placement.
9/20/90	Benham - View east - cap placement.
9/20/90	Benham - View east - cap placement.
9/20/90	Benham - Site backfill work.
9/20/90	Benham - Site backfill work.
9/24/90	Diamond - View southeast at preconstruction.

PHOTOGRAPHS/SLIDES (cont'd)

9/24/90	Diamond - Preconstruction view east.
9/24/90	Diamond - Preconstruction view north.
9/24/90	Diamond - Preconstruction view northeast.
9/24/90	Diamond - Preconstruction view west.
9/24/90	Diamond - Preconstruction view westerly.
9/24/90	Diamond - Preconstruction view west.
9/24/90	Colorado - View east.
9/24/90	Anselmo - Preconstruction.
9/24/90	Anselmo - Preconstruction.
9/24/90	Anselmo - Preconstruction.
9/24/90	Anselmo - Preconstruction.
9/25/90	Anselmo - Backfill placement.
9/26/90	Anselmo - View north at channels.
9/26/90	Anselmo - View north at channels.
9/26/90	Anselmo - View south at second channel.
9/26/90	Anselmo - View of shaft to south.
9/26/90	Anselmo - View west at pads and channels.
9/26/90	Anselmo - Overhead view of cap.
9/26/90	Anselmo - Overhead view of cap.
9/26/90	Anselmo - Sectional view of clearance.
9/26/90	Anselmo - Sectional view of clearance.
9/27/90	Colorado - Cap removal work.
9/27/90	Colorado - Cap removal work.

PHOTOGRAPHS/SLIDES (cont'd)

9/27/90	Colorado Shaft - View of camera enthusiasts.
9/27/90	Colorado Shaft - View of shaft after 2 channels off.
9/27/90	Colorado Shaft - View west at shaft timbers.
9/27/90	Colorado Shaft - View of shaft looking south.
9/27/90	Colorado Shaft - View easterly.
9/27/90	Colorado Shaft - View north.
9/27/90	Colorado Shaft - View of wooden wall adjacent to shaft.
9/27/90	Colorado Shaft - View west at concrete collar.
9/27/90	Colorado Shaft - View west at backfill area.
9/27/90	Colorado Shaft - View of new gravel pad.
9/27/90	Colorado Shaft - View north at channel replacement.
10/1/90	Orphan Boy - Preconstruction - view south.
10/1/90	Orphan Boy - Preconstruction - view west.
10/1/90	Orphan Boy - Preconstruction - view north.
10/1/90	Orphan Boy - Preconstruction - view east.
10/1/90	Orphan Boy - Preconstruction - view northeast.
10/1/90	Orphan Boy - View west at exposed footing.
10/1/90	Orphan Boy - View east at footing wall.
10/1/90	Orphan Boy - View east at excavated trench.
10/1/90	Orphan Boy - View northeast at trench.
10/2/90	Orphan Boy - View of transport with beam.
10/2/90	Orphan Boy - View east at trench.
10/2/90	Orphan Boy - View of beam of trailer.
10/2/90	Orphan Boy - View of west beam pad.

PHOTOGRAPHS/SLIDES (cont'd)

10/2/90	Orphan Boy - View of pedestal on crane.
10/2/90	Orphan Boy - View east at trench.
10/2/90	Orphan Boy - View east at beam.
10/2/90	Orphan Boy - Setting lift hooks.
10/2/90	Orphan Boy - Various view lifting beam.
10/2/90	Orphan Boy - Various view lifting beam.
10/2/90	Orphan Boy - Various view lifting beam.
10/3/90	Orphan Boy - View northwest at cranes.
10/3/90	Orphan Boy - View west at beam.
10/3/90	Orphan Boy - View west at pedestals.
10/3/90	Orphan Boy - View east at beam vs. wall.
10/3/90	Orphan Boy - View west at placed beam.
10/3/90	Orphan Boy - View west at overall.
10/3/90	Orphan Boy - View east at gravel pad.
10/3/90	Orphan Boy - View east beam and pads.
10/3/90	Orphan Boy - View southwest at beam and crane.
10/3/90	Orphan Boy - View west at channel setting.
10/3/90	Orphan Boy - View east at channel setting.
10/3/90	Orphan Boy - View east at channel setting.
10/3/90	Orphan Boy - Preconstruction - north shaft.
10/3/90	Orphan Boy - Preconstruction - north shaft.
10/4/90	Orphan Boy - View at compactor.
10/4/90	Orphan Boy - View of extra grading.
10/4/90	Orphan Boy - View west at site work.

PHOTOGRAPHS/SLIDES (cont'd)

10/4/90	Orphan Boy - View northeast at pads.
10/4/90	Orphan Boy - View east at pads.
10/4/90	Orphan Boy - View south at west fence.
10/4/90	Orphan Boy - View south at pads.
10/5/90	Orphan Boy - View south at channels.
10/5/90	Orphan Boy - View south at channels.
10/5/90	Orphan Boy - View south at channels.
10/5/90	Orphan Boy - View south at completed cap.
10/8/90	Orphan Boy - View of backfill around cap.
10/8/90	Orphan Boy - Completed backfill.
10/8/90	Orphan Boy - View southeast at completed backfill.
10/8/90	Orphan Boy - View west at completed cap backfill.
10/10/90	Anselmo Air - View north at cap embankment.
10/10/90	Anselmo Air - View north at cap embankment.
10/10/90	Otisco - Spreading veneer.
10/10/90	Otisco - Spreading veneer.
10/10/90	Otisco - Spreading veneer.
10/11/90	Anselmo Air - View westerly at completed cap.
10/11/90	Anselmo Air - View southwest at cap at completion.
10/11/90	Anselmo Air - Closeup of door weld.
10/11/90	Anselmo Air - Closeup of door weld.
10/11/90	Humboldt - Veneer placed looking easterly.
10/15/90	Eveline - Preconstruction - view east.
10/15/90	Eveline - Preconstruction - view west.

PHOTOGRAPHS/SLIDES (cont'd)

10/15/90	Eveline - View east at rough pads.
10/15/90	Eveline - View east at rough pads.
10/16/90	Eveline - View southeast at excavation.
10/16/90	Diamond - View north at ditch.
10/16/90	Diamond - View west across site.
10/16/90	Diamond - General site views.
10/16/90	Diamond - General site views.
10/16/90	Diamond - General site views.
10/16/90	Diamond - View northeast at site.
10/17/90	Eveline - View west unloading slabs.
10/17/90	Eveline - View south at overall operation.
10/17/90	Eveline - View north at channel placing.
10/17/90	Eveline - View west at channel placing.
10/17/90	Eveline - View west at channel placing.
10/17/90	Eveline - View south at crane.
10/18/90	West Gagnon - Preconstruction view north.
10/18/90	West Gagnon - Preconstruction view north.
10/18/90	Otisco Shaft - View south at site grading.
10/18/90	Otisco Shaft - View south at site grading.
10/18/90	Otisco Shaft - View southwest at cap.
10/19/90	Eveline - View of Grove Crane - 55 ton.
10/19/90	Eveline - Channel placement.
10/19/90	Eveline - Channel placement.
10/19/90	Eveline - Channel placement.

PHOTOGRAPHS/SLIDES (cont'd)

10/19/90	Eveline - Placing concrete channels.
10/19/90	Eveline - Placing concrete channels.
10/19/90	Eveline - Placing concrete channels.
10/19/90	Eveline - Placing concrete channels.
10/19/90	Eveline - Placing concrete channels.
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10/19/90	Eveline - Placing concrete channels.
10/19/90	Eveline - Placing concrete channels.
10/19/90	Eveline - Site grading.
10/19/90	Eveline - Site grading.
10/19/90	Eveline - Site grading.
10/25/90	Otisco - Brillion drill seeder.
10/25/90	Otisco - Seed equipment - drill.
10/25/90	Otisco - Side view of Brillion drill.
10/25/90	Otisco - View of spike-tooth harrow.
10/25/90	Otisco View of hydromulcher.

PHOTOGRAPHS/SLIDES (cont'd)

10/25/90	Otisco Shaft - View of drill seeder.
10/25/90	Humboldt - View east at overall.
10/25/90	Humboldt - View south at drill seeding.
10/25/90	Humboldt - Mulching operations.
10/25/90	Humboldt - View southeast-completed site.
10/25/90	Humboldt - Closeup of hydromulch.
10/25/90	Humboldt - View west at completion.
10/25/90	Clear Grit - View east at mulch operation.
10/25/90	Clear Grit - View east at overall site.
10/25/90	Clear Grit - View southeast at shaft area.
10/25/90 ,	Clear Grit - View east at shaft mulching.
10/25/90	Clear Grit - View north at completed work.
10/26/90	Downey - View southeast at Discovery shaft.
10/26/90	Downey - View south at Downey before seed.
10/26/90	Downey - View east at seed operations.
10/26/90	Downey - View east at mulch operations.
10/26/90	Downey - View east at mulch operations.
10/26/90	Downey - View west at completion.
10/26/90	West Gagnon - View north at hydromulch.
10/26/90	West Gagnon - View north at hydromulch.
10/26/90	Colorado - View east at completion.
10/26/90	Otisco Shaft - View of seed operations.
10/26/90	Otisco Shaft - View of seed drill and soil preparation.

PHOTOGRAPHS/SLIDES (cont'd)

10/31/90	Clear Grit - View west at RCP/pavement.
10/31/90	Orphan Boy - View southwest at both caps.
10/31/90	Orphan Boy - View west at shaft cap.
10/31/90	Orphan Boy View west at wood retaining wall.
10/31/90	Orphan Boy - View west at completed cap.
10/31/90	Orphan Boy View southwest at overall area.
10/31/90	Otisco Shaft - View south at overall area.
10/31/90	Diamond - View southeast - post construction.
10/31/90	Diamond - View southeast - post construction.
10/31/90	Benham - View east at asphalt match.
10/31/90	Benham - View southwest at overall.
10/31/90	Benham - View south at general asphalt.
10/31/90	Benham - View east at overall site.

